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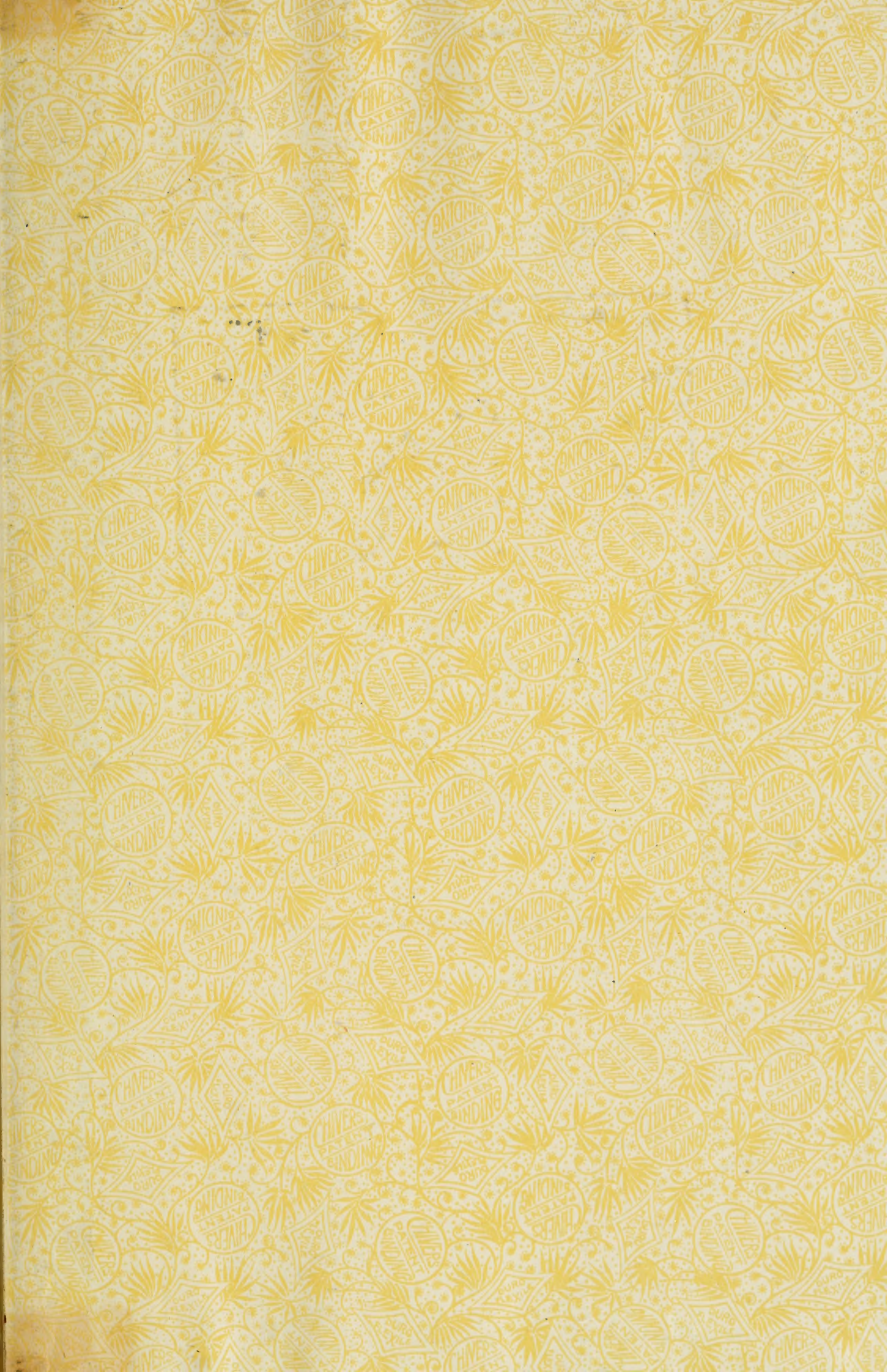


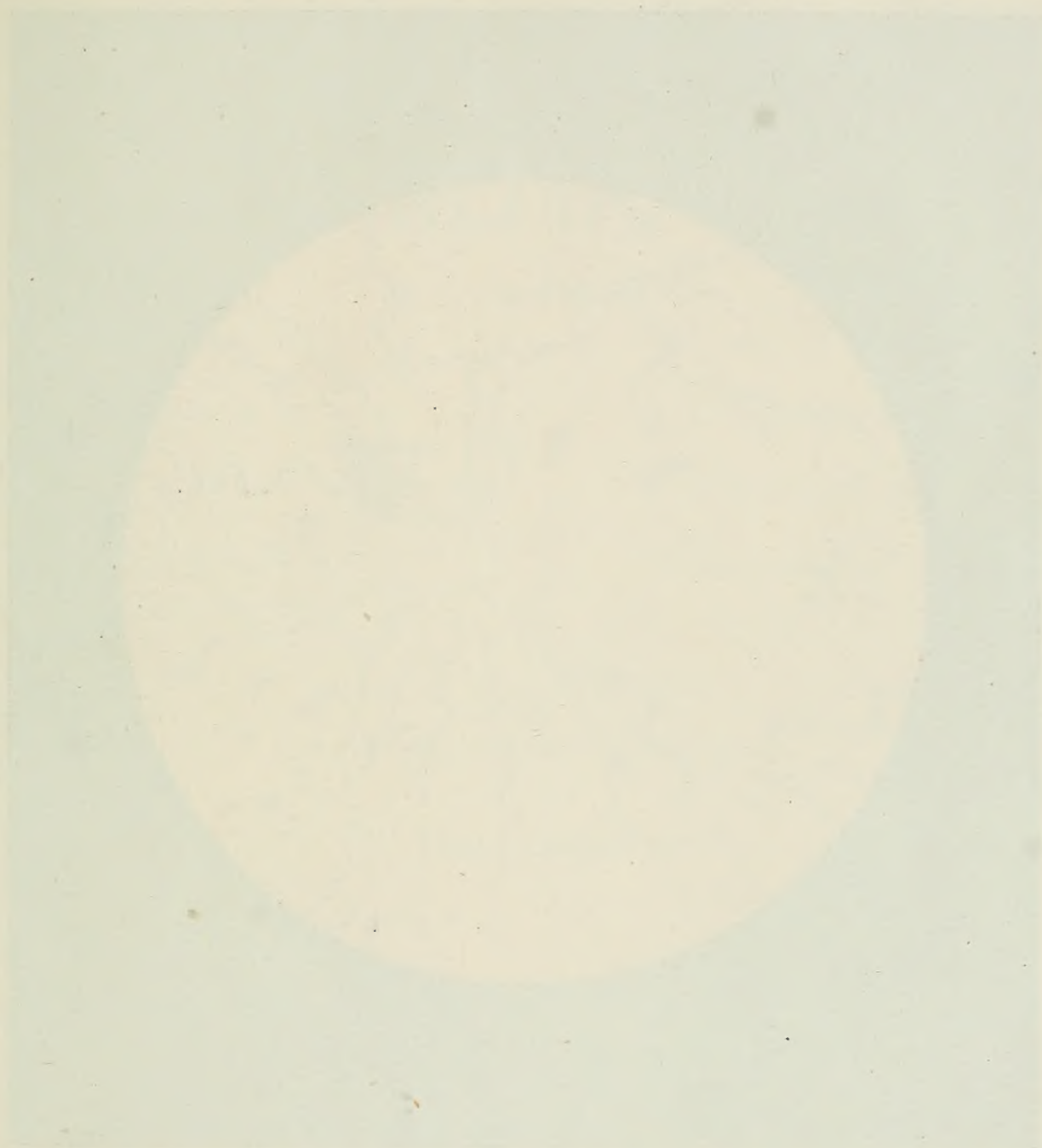
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NEURO-RETINITIS

By Dr. C. H. Beard

1897.

THE OPHTHALMIC RECORD

EDITED BY

CASEY A. WOOD, M. D.

Chicago.

F. C. HOTZ, M. D.

Chicago.

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HAROLD GIFFORD, M. D.

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T. A. WOODRUFF, M. D.

Editorial Secretary.

1102 Reliance Building, Chicago, Ill.

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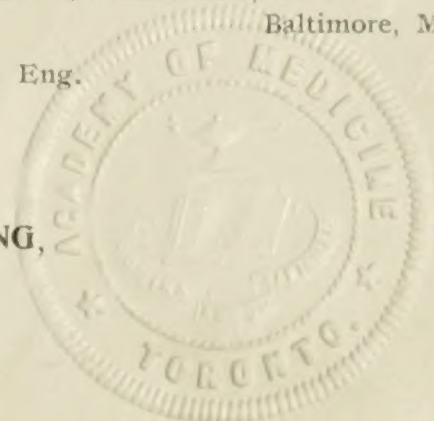
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Baltimore, Md.

C. DEVEREUX MARSHALL, F. R. C. S. Eng., London, Eng.

Suite 3

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CHICAGO.







~THE~ OPHTHALMIC RECORD

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NO 1. NEW SERIES.

ORIGINAL ARTICLES.

AN OBSCURE CASE OF MONOLATERAL NEURO-RETIN- ITIS.

BY CHAS. H. BEARD, M. D.

Of Chicago.

Surgeon to the Illinois Charitable Eye and Ear Infirmary.

(With Colored Frontispiece.)

Mrs. Z., a very bright, highly respectable lady of sixty-four years, consulted me on October 31, 1896, relative to poor sight, more pronounced in the right eye. She fancied that, in order to regain perfect vision, it was only necessary, in her case, to be fitted with proper glasses. She averred that she came of an exceptionally healthy family, was the mother of several robust children, and that her own physical condition had always been most excellent.

The only noticeable abnormality on superficial inspection of the face and eyes was a marked laxity of all the muscles of the right side of the face even to such an extent that the left eye winked while the right orbicularis of the lids remained quiescent. The right eye could be closed, however, without undue effort, the integument over the right half of the frontalis could be corrugated, and the right facial muscles responded to the galvanic current as promptly as did the left. This seeming paralysis of the right seventh nerve the patient declared to be of life-long duration, and a niece, who accompanied her, affirmed that her aunt had always had "a crooked face." Mrs. Z. had no recollection of ever having had an affection of either ear, though the otoscope showed a round cicatrix in the right *membrana tympani*, just posterior to the tip of the malleus handle, evidently of long standing. She heard the acumeter at only one inch with the right ear, and at one foot with the left. Bone conduction was almost wanting on both sides.

The greater reduced vision of the right eye had been first noticed more than a year previously. Aside from the amblyopia there had been no eye trouble. The pupils were of ordinary and equal size, and natural in their reactions. There

was no displacement of the globes, nor any restriction of the ocular movements.

R. V. = $\frac{240}{200}$; not improved by glasses

L. V. = $\frac{20}{200}$; $\frac{20}{20}$ — w. + 1.75 s \subset + 0.5 c ax. 180°. With + 5 D. over left reads J. 1 at 9''

The ophthalmoscope, while evincing clear media in both eyes, disclosed severe neuro-retinitis, with innumerable hemorrhages, in the right, and a perfectly normal fundus in the left. As the right presented a rather striking picture, and, besides, as the case was in some respects unique, I made a painting of it. (See frontispiece.)

There had never been pain in the eyes; never headache, nor dizziness, nor vomiting. There had never been diplopia; and tests with prism and red glass showed exact equilibrium of the ocular muscles. The fields for white of both eyes were of average breadth for one of that age (64). Central vision in the right was interfered with by the macular hemorrhages. (See drawing.) Fields for color, of the left eye, were normal.

In the early summer of the present year the patient became suddenly afflicted with alexia—could not read a word, although she could plainly discern the letters. This defect she attributed to inability to see aright, and, in consequence, consulted an oculist practicing in her native state. It is more than likely that the neuro-retinitis was at that time diagnosed, as the doctor prescribed K. I., and no glasses. The alexia only lasted a week or ten days.

There had been at no time any symptom pointing to disease of the kidneys. Thorough examinations of the urine were made, one by Dr. Williams, interne at the Eye and Ear Infirmary, on November 1st, and one by Dr. Ed. Brougham, pathologist to the Passavant Hospital, on November 13th, proving it, on both occasions, to be absolutely normal, if one might except the fact that at the last examination plentiful crystals of the oxalate of lime were found.

Mrs. Z. was advised to consult a neurologist, and I suggested Dr. Hugh T. Patrick, who made a very careful examination, with entirely negative results. As there was hypertrophy of the heart, and as palpation of the external carotids indicated arterio-sclerosis; furthermore, as all other signs pointing to a cause were lacking, we are inclined to attribute the right neuro-retinitis in this case to a phase of degeneration of the blood-vascular system, similar to those described by Otto, Raehlmann and others.

***CLINICAL NOTES OF A CASE OF INJURY PRODUCING
AS THE MOST PROMINENT SYMPTOM LUXATION
OF THE EYEBALL INTO THE ORBIT: (SO-CALLED
TRAUMATIC ENOPHTHALMOS).**

BY CHARLES A. OLIVER, A. M., M. D.

One of the Attending Surgeons to Wills' Eye Hospital; one of the Ophthalmic Surgeons to the Philadelphia Hospital, etc.

Without endeavoring to solve any problem as to etiology or as to condition, and without presuming to venture any new hypothesis, or wishing to correlate the present example of this character of disturbance with some preexisting theory; and, in fact, with no other motive than to place a fairly well studied instance of most probably the sympathetic type of disorder (one presenting a new and a curious symptom) upon record, in the hopes that its recital may add some additional symptomatology to the previous more or less imperfect studies of the incomplete variety of the disease—the writer offers the following, at least to him, interesting case:

On the 14th of July, 1892, I saw a 47 year old weaver at my clinic at Wills' Eye Hospital for the first and only time. The patient stated that five weeks previously he had been struck in the left eye with a shuttle. The eyeball and the surrounding tissues had been much inflamed for the first three weeks, during which time he had been under professional advice.

He came complaining of defective sight in the injured eye. Uncorrected vision with the right eye equalled one-half of normal, this being accounted for by a manifest hypermetropia. Uncorrected vision in the left eye was much lower, it equalling one-seventh of normal with the same amount of manifest hypermetropia. Accommodative play in each eye was normal for the age of the patient and the refractive condition.

Upon monocular exposure, the right pupil, which was round, measured two and one-half millimeters in its horizontal meridian, whilst that of the left eye under the same condition, had a diameter of four millimeters in the same meridian. Both irides, which were of good tint, were quite prompt to light-stimulus, accommodation, and efforts for convergence, the iris of the injured eye being possibly a trifle sluggish. There was a marked recession of the left globe into the orbit, the anterior plane of the cornea being at least four to five millimeters behind that of its fellow. The lids were slightly depressed and the palpebral fissure was about three millimeters shorter than that of the right lids, the opening being still further shortened and narrowed when the patient was made to gaze straight ahead with the right eye.

There was almost complete paralysis of the left superior rectus muscle, the superior limbus of the left cornea being two and a half millimeters lower than that of the opposite eye. Further study of the false and the true projection images showed a slight paresis of the left inferior oblique muscle. During these examinations it was several times noticed that when attempts were made with the two

*Paper read before the May, 1896, Meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia.

eyes to fix upon a near-object upon the median line, a spasmodic twitching of both alae of the nose, which was more marked on the left side, appeared. At other times, the clonic spasm of the nasal alae was found to be synchronous with a series of rapid movements of the orbicularis palpebrarum, but when the orbicularis was made to act forcibly, the clonic spasm of the angles of the nose stopped, and the nostrils were drawn spastically together. As far as could be palpated, there did not seem to be any fracture in the external portions of the skull in the region of the eye.

To ascertain if there were any nasal disturbances the case was sent to my friend, Dr. Walter J. Freeman, who, upon the following day made a careful examination. His report, under date of the 14th July, 1892, read as follows:

"DEAR DR. OLIVER. J. S., whom you very kindly referred, brought me your note to day. The nose shows old injury dating back probably many years of fracture of triangular cartilage of the septum. The antrum on the left side is perfectly free, as shown by transmitted electric light, and there is no collection of pus, nor trace of recent injury anywhere. The inferior turbinated body is hypertrophied on the left side sufficiently so to warrant me to inquire as to lachrymation, but of that I could get no definite reply. There is general congestion of nose and throat."

METAMORPHOPSIA.

By E. C. ELLETT, M. D.

Of Memphis, Tenn.

Case I. Mrs. McG., Aet. 25—O. D. $\frac{3}{80}$ p., O. S. $\frac{2}{80}$ p

Under Mydriatic, O. D.—S. 0.25, \bigcirc —cy. 1.25, ax. $110^{\circ} = \frac{3}{80}$.

O. S.—S. 0.50, \bigcirc —cy. 1.00, ax. $80^{\circ} = \frac{2}{80}$.

Ordered full correction. Marked obliquity of vision, disappearing in a few days. Glasses comfortable and relieved asthenopia. Has used them three years.

Case II. Miss C., Aet. 27. O. D. $\frac{2}{80}$; O. S. $\frac{2}{80}$.

Under Mydriatic, O. D. + cy. 5.00, ax. 165° \bigcirc —S. 1.50 = $\frac{2}{80}$ p.

O. S. + cy. 5.00, ax. 30° \bigcirc —S. 1.00 = $\frac{2}{80}$ p.

Ordered full correction. Noticed that a shelf, e. g., mantelpiece, seemed to incline towards her. This was constant for a while, but now (after one year) is seen very rarely. Her vision rose to $\frac{2}{80}$, mostly in three months, and her eyes are comfortable.

Case III. Mrs. S., Aet. 23. O. D. $\frac{2}{80}$, O. S. $\frac{2}{80}$.

Under Mydriatic, O. D. + cy. 5.00, ax. 120° \bigcirc —S. 1.00 = $\frac{2}{80}$.

O. S. + cy. 3.50, ax. $90^{\circ} = \frac{2}{80}$.

Ordered O. D. + cy. 3.50, ax. 120° \bigcirc —S. 1.00; O. S. + cy. 1.25, ax. 90° , these giving best and most comfortable post-mydriatic vision. Rectangle narrow at top for two or three weeks. Vision is now $\frac{2}{80}$ mostly (after a year) and comfortable.

Case IV. Mrs. S., Aet. 27. O. D. $\frac{3}{80}$ p, O. S. $\frac{2}{80}$.

Under Mydriatic, O. D. + S. 1.00 \bigcirc —cy. 1.00, ax. $180^{\circ} = \frac{2}{80}$.

O. S. + S. 1.50 \bigcirc —cy. 3.00, ax. $155^{\circ} = \frac{2}{80}$ p.

Ordered O. D. — cy. 1.00, ax. 180° , O. S. — cy. 3.00, ax. 155° . Marked obliquity of vision passing off after ten days. Glasses relieved frontal headache, blepharitis marginalis and asthenopia, and have been worn constantly for one year. He wrote nine months later: "In answer to your inquiry regarding the oblique sight of my eyes when first using the glasses, will say that it passed away in about eight or ten days after. * * * My eyes are now better than they have been for years."

Case V. Miss H., Aet. 24. O. D. $\frac{2}{80}$, O. S. $\frac{2}{80}$.

Under Mydriatic, O. D. + cy. 3.50, ax. $120^{\circ} = \frac{2}{80}$.

O. S. + cy. 3.50, ax. $60^{\circ} = \frac{2}{80}$.

Ordered + 3.00 cy. ax. as above in each eye, obliquity of vision for a few days. Asthenopia relieved.

Case VI. Miss S., Aet. 18. O. D. $\frac{1}{80}$, O. S. $\frac{2}{80}$.

Under Mydriatic, O. D. — S. 2.25 \bigcirc —cy. 1.25, ax. $135^{\circ} = \frac{2}{80}$.

O. S. — S. 2.50 \bigcirc —cy. 1.25, ax. $15^{\circ} = \frac{2}{80}$.

Ordered full correction. Obliquity of vision, causing a rectangle to look narrower at the top and at the left end when seen with both eyes. With either eye separately it looked as it should. This disappeared in a few days.

Case VII. Miss G., Aet. 25. O. D. $\frac{1}{80}$, O. S. $\frac{2}{80}$ m

Under Mydriatic, O. D. + cy. 0.25, ax. 165° \bigcirc —cy. 2.50, ax. $75^{\circ} = \frac{2}{80}$

O. S. + cy. 0.50, ax. $90^{\circ} = \frac{2}{80}$

Ordered O. D. — cy. 2.50, ax. 75° , O. S. + cy. 0.50, ax. 90° . A rectangular card looked narrower at the right end by reason of a sloping down and to the right of its upper border. This lasted a few days.

SOME UNUSUAL CONGENITAL ANOMALIES OF THE EYE.

By SWAN M. BURNETT, M. D., PH. D.,
WASHINGTON, D. C.

Professor of Ophthalmology and Otology University of Georgetown. Director of the Eye and Ear Clinic at the Central Dispensary and Emergency Hospital. Ophthalmic Surgeon to the Children's and the Providence Hospitals.

ILLUSTRATED.

Case I. Peculiar Foldings of the Conjunctiva in Both Eyes.—

LOTTIE W.—A colored girl of 9 years was brought to my clinic in April, 1896, for a concomitant convergent strabismus of the left eye. Aside from the strabismus, which is very uncommon in this race, the most noticeable feature was the appearance of the conjunctiva of the globe towards the inner canthus of both eyes.

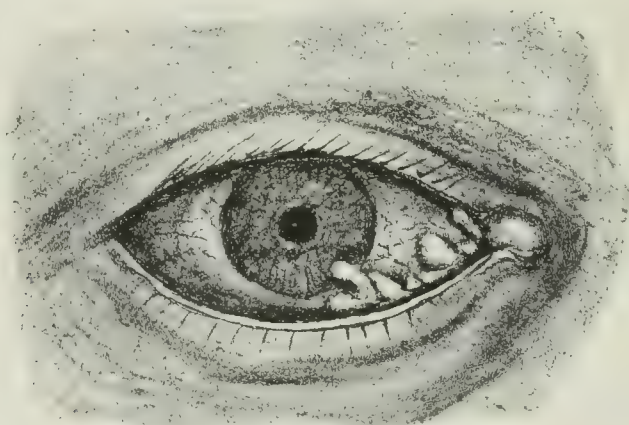


Fig. I.

There was a spot of attachment to the cornea at the lower inner quadrant about 6 mm inside of the clear margin and raised 2 mm above the corneal level but evidently imbedded in it. Around this the cornea was perfectly clear. From this spot the folds extended down and towards the caruncle, which was more or less lost in them, and one fold extended upwards from the superior edge of the caruncle under the upper lid. These foldings did not seem to be simply enlargements or thickenings of the mucous membrane but genuine duplications whose form changed with the movements of the eyeball which put the conjunctiva on the stretch.

Figure 1 gives an idea of the peculiar foldings of this membrane.

The foldings and their place of departure on the cornea were practically identical in size and shape in the two eyes. There was no anomaly in any other part of the anatomy of the eyes or the surrounding orbit. The mother stated that the condition had existed since birth and that the eyes had never been inflamed.

The congenital nature of the condition seems placed beyond a doubt and the only question is as to whether it is the result of an intra uterine ulcer of the cornea in which a fold of the conjunctiva became entangled and remained adherent, or whether it is an anomaly in development. The latter seems to me the more probable, 1st, on account of the almost perfect symmetry of the malformation which would hardly be possible in a pathological process, 2nd, because of

the duplication extending from the caruncle under the upper lid. It appears that the development of the lids and conjunctiva, both from the ectoderm, occur close to or concomitantly with the closure of the lachrymo-nasal groove (*Ryder, Norris & Oliver System of Diseases of the Eye*), and some hitch in the regular process of development might easily lead to such duplication. The adhesion to the cornea, however, is not so easily accounted for.

Case II. Congenital Opacity of the Cornea.—

LATMA—Colored child, 5 years old, was seen at the Children's Hospital October 17th, 1894. She was a healthy, though rather a delicate looking mulatto, and according to the statement of her mother, the condition of her eyes had been essentially the same since birth. There had never been any inflammation, redness or discharge. There was a generally diffuse opacity of both corneae which at the periphery gradually merged itself unto the sclerotic. Through the centre there was a space almost circular in shape through which the iris and pupil could be faintly seen; this was bounded by a ring of dense opacity of an almost uniform width of 3 m m. Outside of this the corneal tissue was again semi-transparent showing the color of the iris faintly, still outside of this the opacity of the cornea merged into the sclera.

The cornea, as a whole, appeared oblong horizontally and measured up to the ill-formed scleral edge 10 m m in the horizontal, and 8 m m in the vertical direction. As a whole it seemed flatter than the normal and the anterior chamber appeared shallow.

Fig. II shows the condition fairly well.

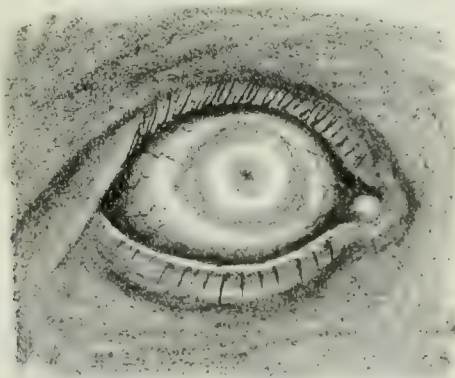


Fig. II.

Both corneae were in essentially the same condition as to the particular features. Both were horizontally long, with an obtuse angle to the temporal side and the width of the opaque ring and the clearer spaces in both were practically the same. The symmetry of the condition was quite as perfect as we can see in congenital anomalies.

The amount of vision possessed by the child could not be accurately determined. She seemed to have a visual power quite beyond what would be expected from the condition of the eyes. She had no difficulty in going about the ward and played with the other children in the liveliest way and made few of the mistakes of a blind person. While no jerky nystagmus was presented the eyes

were very unsteady. There were no evidence of inherited syphilis. The history of her parents could not be had.

Cases of congenital opacities of the cornea, while not very rare, are yet sufficiently uncommon to justify the recording of every newly observed case. Opinions differ as to whether they are due to intra-uterine inflammation or to defective or arrested development. The question is discussed in the *Graefe-Saemisch Handbuch* and in *Vol. I of Norris and Oliver System* and it is needless to go into a detailed consideration of it here.

Without doubt it may be due to either. The case recorded above, it seems to me, belongs to the defective development class. Asymmetry so nearly perfect as exists here could hardly follow an inflammatory trouble. The condition must be the result of a process which acted equally on both sides, and this we could only have in the law of development of the tissues.

Case III. Floating Filamentous Band in the Vitreous.—

R. A. C.—A boy of 5 years was seen first on May 8th, 1895. He came on account of a tendency of the left eye to turn in, having been noticed by his mother since early infancy. The right eye was found to be normal in all particulars. The left is practically blind, there being only perception of shadows, and there is no attempt at fixation. There has been no injury or inflammation of that eye. The pupil is normal and responds to light and the lens is clear throughout. On looking directly into the pupil with the ophthalmoscope a floating film is seen originating by a broad base apparently from below the lens and to the outer side. From thence it runs backwards condensing into a band, which divides into two parts which continue on their way towards the posterior of the eye. Fig. III.



Fig. III.

In looking at the fundus with the ophthalmoscope two fine filamentous bands are seen starting from near the centre of the disc, and running downward, meet the bands coming from the anterior part of the eye. A definite attachment to the disc cannot be made out.

As the fundus picture shows Fig. IV, the vascularization of the disc and retina do not depart from the normal; nor were there any changes in the rest of the

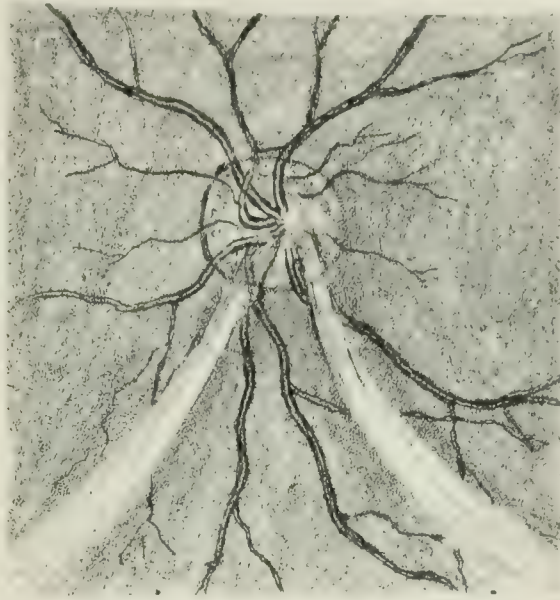


Fig. IV

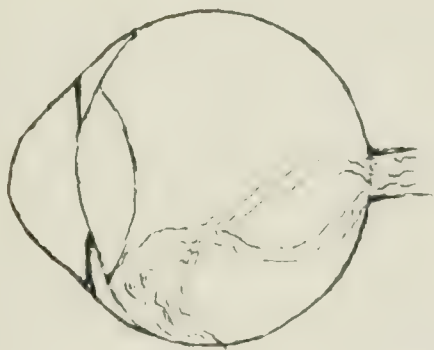


Fig. V.

fundus which could be considered abnormal. A profile view of the supposed arrangement is shown in Fig. V.

The marked amblyopia present could not have been due directly or solely to the interference of the floating membrane with the formation of a clear image. This was a factor undoubtedly at the beginning, but the diminished visual acuteness would seem to be rather the result of a defective development of that sense dating back to birth, and resting possibly, partly on an original defective sense perception, aided by the obstruction to a clear retinal image presented by the membrane.

Whether the membrane is pathological or simply an abnormal development can hardly be determined now, but that it is congenital I regard as quite certain.

The only reference I have been able to find regarding congenital films in the vitreous is contained in Treacher Collins' recent monograph "*Researches into the Anatomy and Pathology of the Eye*," London, 1896. On page 43-44, he says: "The congenital defect is I believe due to some irregular development of the mesoblast tissue, which normally passes in at the ocular cleft to form the vitreous humor.

"Hess, who has met with fibrous tissue of a similar character in different parts of the vitreous in microphthalmic eyes, states, he cannot regard it as an inflammatory product, but considers it to be the result of an atypical embryonic development of the intruded mesodermic layer which goes to form the vitreous."

A CASE OF GLAUCOMA FOLLOWING THE USE OF ATROPIA.

BY DR. EDWARD J. BROWN.

Of Minneapolis, Minn.

C., aged 61 years, a retired clergyman, consulted me June 23, 1894, seeking relief from asthenopic and nervous symptoms. Said he had consulted the most eminent oculists in the country who had prescribed glasses, none of which had been of the slightest assistance. He had been retired since 1882, wholly unable to work, and able to use his eyes for but a few moments at a time and then at the cost of much suffering.

At the age of seven years he fell against a desk striking the left side of his face and receiving an injury which resulted in marked failure of development of the entire left side of the face. At the age of twenty-four years, while in college, his eyes became weak, and have been a source of trouble ever since. At the age of thirty-four years he had a nervous break down and pulmonary hemorrhages. Has always been neurasthenic and dyspeptic.

I found the following condition: Eyes very sensitive to light, but they appeared to be normal, as the ophthalmoscope revealed only myopic astigmatism, a deep physiological cup in right and a slight one in left eye.

V. O. D. $\frac{29}{60}$: with — 2. — .50 cyl. ax. hor. — $\frac{13}{60}$.

V. O. S. $\frac{29}{60}$: with — 2. cyl. ax. 60° nasal — $\frac{13}{60}$.

Right hyperphoria, 1°. Esophoria, 5°. At 13'' Exophoria, 6°.

Considering the case a proper one for the use of atropia, he was given a drop of a four grain solution in each eye, requested to repeat the drops in the evening and morning, and to return the following day. Not feeling well he did not return till the 26th, three days later. Just how many drops of atropia were used I am unable to say. I found nothing new at this visit except a change in axis of the right cylinder from horizontal to 60 temporal.

June 30th Mr. C. came to me saying he had noticed colored haloes around lights for three or four days, possibly since the 25th. Vision was unaffected; tension doubtful. He was given drops of a $\frac{1}{4}$ % solution of eserine sulphate, which caused pain. Both fields were slightly contracted, especially the upper and lower quadrants, the L. more than the R. He did not report again until the 4th of July, when I found the pupils still moderately dilated, L. cornea less sensitive than the right, arterial pulsation not venous on pressure, and slightly increased tension L.

July 8th. No haloes and no eserine since the 5th. Pupils three mm. wide, and react normally. Tension, both eyes, normal. Fields practically unchanged since June 30th.

He was given a week solution of eserine which was used for some weeks and then discontinued. Glasses for distance and reading were given which have afforded a degree of comfort he had not enjoyed for years, and he has not had sufficient trouble with his eyes since to submit to the discomfort of an operation.

IMAGE-CHANGE CAUSED BY ASTIGMATISM AND BY CORRECTING CYLINDERS.

BY G. C. SAVAGE, M. D.

Of Nashville, Tennessee.

Professor of Ophthalmology in Med. Dept. Vanderbilt University.

ILLUSTRATED.

The accompanying illustrations are so simple, easily understood and at the same time correct, that no apology for this paper seems necessary. These, at a glance, make clear what I have long taught as to the obliquity of retinal images in oblique astigmatism, the correctness of which, though at first denied by my critics, is now doubted by no one who has at all studied what has already appeared. A great deal of hard work, and the slight annoyance one always feels when criticised, although knowing the critics to be in error, might all have been avoided if these simple illustrations had occurred to me at the beginning.

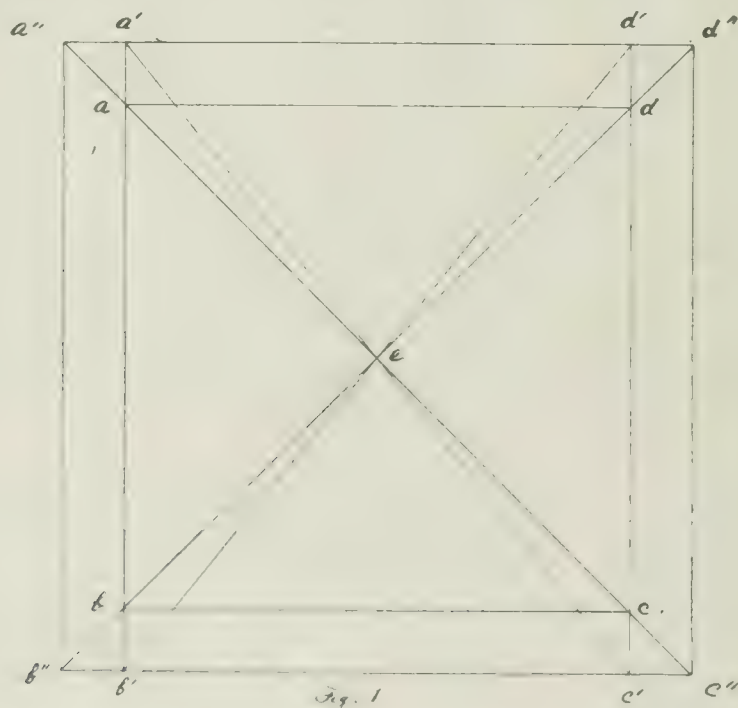


Fig. 1 is complex, showing a square as seen by a non-astigmatic eye, as seen by an eye astigmatic according to the rule, and as seen by the latter after the astigmatism has been corrected by a plus cylinder. The rectangle $a-b-c-d$ is the square seen by the non-astigmatic eye, and $a-c$ and $d-b$ show the diagonals of this square. The rectangle $a'-b'-c'-d'$ is the figure seen by the astigmatic eye with the meridian of greatest curvature vertical. The axial rays from the ends of the lines $a-b$ and $d-c$ enter the eye through parts of the cornea parallel with the meridian of greatest curvature and so near to it that their

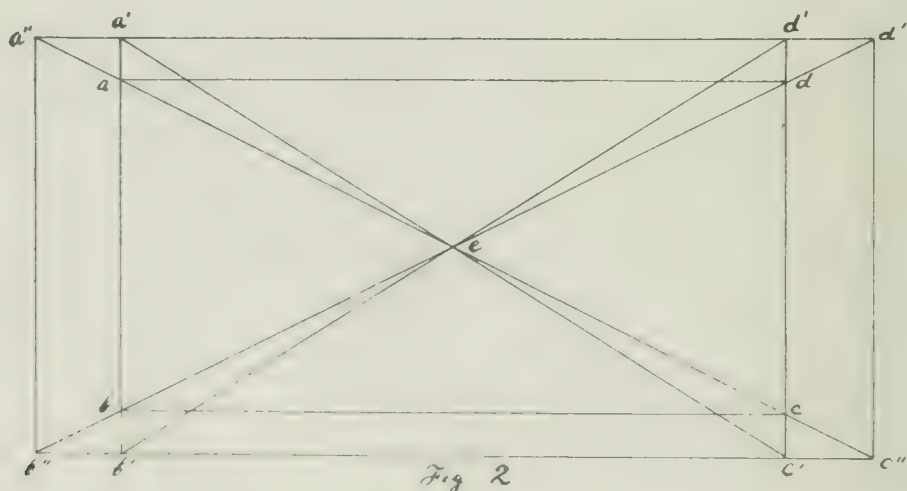
refractive power is practically the same. The refraction of these axial rays from a and b , by the cornea, is such as to make them cross each other, on their way back to the retina, sooner than they would have done if there had been no astigmatism, hence their points of impingement on the retina are more widely separated and the line itself must be proportionately increased. The same is true of the axial rays from the ends of the line $d-c$. Hence it is clear that the line $a-b$ must become the line $a'-b'$ and the line $d-c$ must become the line $d'-c'$. Because of the increase of the length of the lines $a-b$ and $d-c$, the lines $a-d$ and $b-c$ are more widely separated, becoming lines $a'-d'$ and $b'-c'$, and we have, not a square, but the rectangular parallelogram $a'-b'-c'-d'$. The diagonal $a-c$ has been rotated towards the vertical and becomes $a'-c'$; and the diagonal $d-b$ has been rotated in the opposite direction, but also towards the vertical, and becomes $d'-b'$. They have both been rotated by the refraction of the astigmatic cornea towards the meridian of greatest curvature. The image-changes effected by this astigmatic cornea are, as shown in the figure: increase in the length of the lines parallel with the meridian of greatest curvature, an increase in the distance between the lines parallel with the meridian of least curvature, and a corresponding rotation of the diagonals toward the meridian of greatest curvature. The proper plus cylinder placed before this eye gives such aid to the least curved meridian of the cornea as to make its refractive power exactly equal to the unaided refractive power of the meridian of greatest curvature. The result will be a lengthening of the horizontal lines $a'-d'$ and $b'-c'$ into the lines $a''-d''$ and $b''-c''$ and a displacement of the lines $a'-b'$ and $d'-c'$ until they become $a''-b''$ and $d''-c''$. Since two of the sides ($a-b$ and $d-c$) of the square have been lengthened by the astigmatism and the remaining two sides ($a-d$ and $b-c$) have been lengthened to exactly the same extent by the correcting plus cylinder, the figure $a''-b''-c''-d''$, seen by the corrected astigmatic eye, is a square. The cylinder, in changing the rectangular parallelogram $a'-b'-c'-d'$ to the square $a''-b''-c''-d''$, has also rotated the diagonals $a'-c'$ and $d'-b'$ back to their original positions since the diagonal $a''-c''$ coincides exactly with the diagonal $a-c$, and the diagonal $d''-b''$ coincides with $d-b$.

If the astigmatism had been corrected by a minus cylinder the lines $a'-b'$ and $d'-c'$ would have been shortened into the lines $a-b$ and $d-c$; the lines $a'-d'$ and $b'-c'$ would have been brought closer together, $a'-d'$ becoming $a-d$ and $b'-c'$ becoming $b-c$, and the diagonals $a'-c'$ and $d'-b'$ would have been rotated back into the diagonals $a-c$ and $d-b$ respectively, so that the figure thus seen would be the square $a-b-c-d$. Thus it is shown that an astigmatic eye, corrected with a minus cylin-

der, sees the square with the same measurements as that seen by the non-astigmatic eye; while the square seen by the astigmatic eye, corrected with a plus cylinder, is magnified.

Turning the right side of Fig. 1 up it shows the image-changes when the meridian of greatest curvature is horizontal. In either case the lines parallel with the meridian of greatest curvature are made longer by the astigmatism, with a corresponding increase of distance between the lines parallel with the meridian of least curvature, and the diagonals are rotated towards the meridian of greatest curvature.

If there is astigmatism of one eye with the meridian of greatest curvature vertical and astigmatism of the same kind in the other eye with the meridian of greatest curvature horizontal, the former will see a square changed into a rectangular parallelogram longer sides vertical, while the latter would see the square similarly changed but with the longer sides horizontal. The images in such eyes would be dissimilar and could not be perfectly fused; correcting cylinders would make the images alike and thus make complete fusion possible.



What is true of squares is true of rectangular parallelograms, as shown by Fig. 2, in which there is the same proportionate lengthening of two of the sides by the astigmatism, and of the other two sides by the astigmatic correction with plus cylinders, also the same character of rotations of the diagonals, the principal meridians being vertical and horizontal.

Fig. 3 shows the image-changes when the astigmatism is oblique, the meridian of greatest curvature being at 135° . That part of the complex figure shown by $a-b-c-d$ is a square as seen by a non-astigmatic eye. Looked at by the oblique astigmatic eye already mentioned, the diagonal $a-c$ being at an angle of 135° is in a plane with the meridian of greatest curvature, while the diagonal $d-b$ is in a plane with the

meridian of least curvature. For reasons already given in discussing Fig. 1, the diagonal $a-c$ is increased in length by the astigmatism into $a'-c'$, while the diagonal $d-b$ is neither altered in length nor direction. The sides of the square not being parallel with the principal meridians

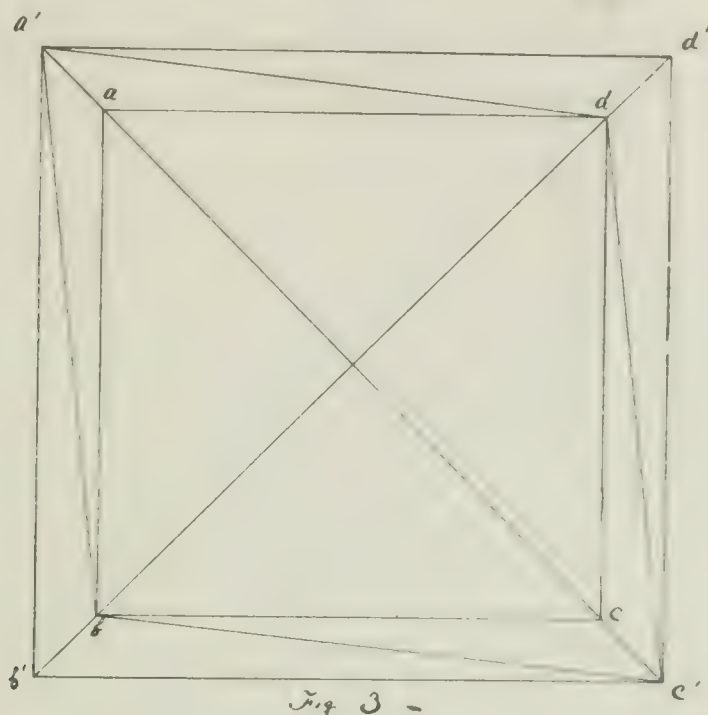


Fig 3 -

must be rotated towards the meridian of greatest curvature, $a-b$ becoming $a'-b'$, $a-d$ becoming $a'-d'$, $b-c$ becoming $b'-c'$ and $d-c$ becoming $d'-c'$. The figure $a'-b'-c'-d'$ is a non-rectangular parallelogram leaning down and to the right. A plus cylinder correcting the astigmatism will increase the length of the diagonal $d-b$ into $d'-b'$ to exactly the length of the diagonal $a'-c'$ and at the same time will rotate the line $a'-b$ to $a'-b'$, $a'-d$ to $a'-d'$, $c'-b$ to $c'-b'$ and $c'-d$ to $c'-d'$, thus converting the non-rectangular parallelogram $a'-b'-c'-d'$ into the magnified square $a'-b'-c'-d'$.

(TO BE CONTINUED.)

A NEW PATTERN OF BIFOCALS FOR MYOPES.

By F. C. HOTZ, M. D.,

Chicago.

ILLUSTRATED.

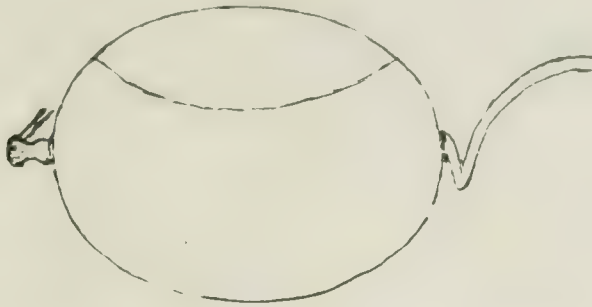
Bifocal lenses are usually so constructed that upon the lower portion of the full-correcting lens a small semilunar segment is cemented to adjust the refraction for near work. The upper edge of the segment being but a few millimeters below the center of the lens comes across the pupil if the visual line is slightly depressed below the horizontal plane. Now, in walking we do not look away towards the horizon, but towards the ground about 10 to 20 feet before us or at the people about us; and the visual line is directed downwards more or less and the edge of the segment coming in front of the pupil causes a very distressing visual confusion. The objects about us get so mixed up and unsteady that crossing a crowded thoroughfare becomes a very hazardous undertaking; one is in constant fear of running against somebody or being run over by the passing vehicles because one cannot truly judge the actual location of things. To avoid this disturbing effect the wearer of such bifocals turns his head down and his eyes up in order to see the sidewalk and objects before him clearly through the upper portion of his glasses—an awkward position of which the eyes soon get tired.

But I have found these bifocals unsatisfactory also in reading and writing. The smallness of the segment allows such a limited field that the slightest rotation of the eyes gets the edge of the segment across the pupils and causes a confusion of vision; hence the eyes are tied up, as it were, in one position; one is compelled to turn the head to follow the print along the line or to look from one object on the writing table to another.

These and other disadvantages account for the fact that many people can never get accustomed to bifocal lenses. I myself have found it positively impossible to wear them with any degree of comfort and helped myself by putting over my spectacles a pair of eyeglasses to enjoy clear distant vision. But, of course, this makeshift has also its inconveniences.

Now, all the objectionable features inherent in the bifocal lens are removed and for nearsighted people a very satisfactory bifocal lens is obtained if we set in the frame the lens appropriate for near work and add to its *upper* portion a segment to make up for the full correction of the myopia. The important part is the proper size and shape of the segment which must neither be too small nor too large. After

repeated trials I found the shape and size represented in the accompanying diagram the most satisfactory.



Its dimensions vary according to the size of the lens; for the so-called OO eye the segment should be 30 mill. long and 12 mill. high; for the O eye it should be 28 mill. long and 11 mill. high; and for the No. 1 eye the segment should be 26 by 10 mill.; the larger sizes are preferable for bifocal lenses.

In these bifocals the lowest point of the segment is 3 mill. above the center of the lens. The wearer, therefore, enjoys in reading the same large unobstructed field of fixation and can turn his eyes right and left with the same freedom as with the simple pair of reading glasses. On the other hand, the long dimension of the segment affords the eye a very wide field of distinct vision; it can freely turn right and left so as to cover a large piece of ground before the visual lines come across the edge of the segment. In walking I do not experience the slightest inconvenience or discomfort; within 10 feet in front of me I see the ground distinctly enough through the lower part of my glasses and beyond that distance I look through the segments; and in this transition from the lower to the upper part of the bifocal I do not notice at all where the pupil passes across the edge of the segment. Nor do I have to turn my head down or up to look through the lower or upper part of the lenses.

I have been wearing these new bifocals (— 6 D with — 2.50 D as segments) constantly during the past three months, on the street and in the operating room, for reading and ophthalmoscopic examinations; and I can really say they have been to me a source of intense pleasure; they are my dearest friends from whom I would not be willing to part for any consideration; they have got me as near to the condition of an emmetrope as mechanical processes possibly can do it.

The idea of this new bifocal lens was indirectly and unintentionally suggested to me by Dr. Southard of San Francisco. In his paper on an improved bifocal published in the *Annals of Ophthalmology and Otology* (July 1896) the illustration was printed upside down; when I

first looked at the diagram I thought his improvement consisted in placing the segment above instead of below; and after I recognized the mistake the thought still clung to me that the inversion of the segment might possibly be advantageous for myopes requiring different lenses for near and distant vision. I at once acted upon this inspiration with the happy results reported above.

For obvious reasons bifocals of this pattern would not be satisfactory to hypermetropes.

A CASE OF FOREIGN BODY IN THE CANALICULUS.

By LEWIS H. TAYLOR, M. D.,
Of Wilkesbarre, Pa.

The farmer, while probably exempt from many of the diseases and accidents to which the eyes of the artisan and miner are liable, is by no means free from the annoyance of foreign bodies in the eye. A few years ago a gentleman came to me for a troublesome conjunctivitis which had annoyed him for some weeks, and which dated from the entrance of chaff in his eye while he was engaged in threshing wheat. Upon careful examination I found a curved piece of wheat chaff firmly attached by its concave side to the bulbar conjunctiva. This had remained in his eye a full month and yet had done no serious injury. Its removal soon relieved all troublesome symptoms. Another interesting case has recently come under my observation.

J. M., a young man about twenty-five years of age called November 13, 1896, for a troublesome condition of his right eye which had lasted since September 28th, on which date he was engaged in threshing rye, and thought a rye beard had entered his eye. He went the next day to a skillful oculist for its removal. The latter after careful examination failed to find any foreign body and assured him that none was there, and gave a wash for the inflamed condition existing. He now, November 13th, still thought there was something in the eye but at first I could find nothing. As he located the irritation near the inner canthus I took a small eye spoon and passed it gently over the caruncle. While doing so I noticed a slight protrusion from the upper punctum. This I succeeded in grasping with a pair of small forceps and removed a piece of rye beard three-sixteenths of an inch long. The eye was still irritated but a wash of boracic acid was all that was necessary to relieve this symptom.

The only interest attaching to the case was the peculiar location of the foreign body. As it would not be likely to wander from any other position in the eye and enter the upper canaliculus, it is quite likely that the piece was thrown directly into the punctum at the time of the accident. Being exceedingly small, light colored and almost entirely concealed, it was easily overlooked by the gentleman who made the first examination.

IRRIGATION IN PURULENT CONJUNCTIVITIS WITH A COMBINED RETRACTOR AND SULCUS-SYRINGE.

BY GEO. M. GOULD, A. M., M. D. AND WALTER L. PYLE, A. M., M. D.

Of Philadelphia, Pa.

ILLUSTRATED.

Purulent ophthalmia is the most general cause of blindness. Rivere of Bordeaux (*Annales de Gynécologie*, 1887) states that ophthalmia neonatorum (preferably called *neonatorum conjunctivitis*) has been the cause of over 100,000 cases of blindness at present dependent on the charity of the European nations, and adds that it is responsible for one-third of all the cases of blindness in Europe. In this country investigators have reached similar conclusions. Yet despite the enormity of the ravages of this disease, it is a perfectly plausible proposition to say that if taken in time and correctly treated, purulent conjunctivitis is an easily curable affection. Some of the more sanguine observers, as Galezowski, contend that Crede's method is absolutely uncalled for and sometimes harmful, and argue that to drop an irritant solution into the sensitive eyes of every new-born babe is cruel, as they believe that every case of this disease appearing in the first few days of life is readily cured without any resultant sequelae of significance.

Surely it seems that especial attention to the slightest sign of inflammation in the first few weeks after birth is a far more rational and satisfactory procedure than the prophylactic measure of Credé with the subsequent indifference of safety that occasionally follows it; however Credé's method should be uniformly pursued in distinctly suspicious cases. The instillation of silver nitrate is no guarantee against the disease. Every mother or nurse should be carefully warned to watch the infant's eyes for, at least three weeks, and to summon a physician immediately on the sign of any inflammation. In the absence of subjective symptoms in treating infants, we should be doubly alert for objective signs of danger. It is particularly in hospital practice and in cases under strictly medical care that we can hope to suppress this deplorable evil of preventable blindness. Among the hopelessly ignorant there seems to be but little encouragement for the practice of scientific measures. The first and most valuable part of treatment is thorough irrigation at short intervals. This is the fundamental principle in the therapeutics of all antioinoculable and purulent processes. Remove the self multiplying cause and assist nature to combat the original infection. It is our opinion that most cases of purulent conjunctivitis may be cured solely by repeated irrigations with sterile water. Strong antiseptic applications are usually unnecessary. The infection soon gains access to tissues possibly

beyond the reach of local antiseptics, and moreover such substances in germicidal strength have generally a devitalizing effect on the tissues involved, and this is exactly what we wish to avoid. Every spark of vitality is needed to resist the invading process. Weaken the normal resisting power and the infection is soon beyond the reach of local treatment and the all-important tissues are forever injured or destroyed. Let cleanliness be Nature's assistant and only when the curative process is delayed let stimulating applications be applied. Silver nitrate is beyond question most valuable. Also in such cases the best hygienic conditions and tonic constitutional treatment is demanded. Feed the patient well, whether infant or adult.

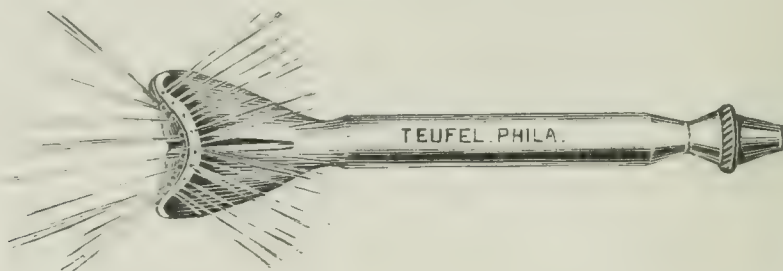
In view of its importance it is unfortunate that thorough and repeated irrigation of the sulcus is seldom effected. To cleanse at intervals of a half-hour every portion of an infected conjunctiva in an active state of purulent inflammation is a difficult task. The lids are tense and swollen. The palpebral and bulbar conjunctival surfaces are as it were glued together, making the depths of the sulci almost inaccessible. The pain in the manipulation is intense. An infant vigorously resists all efforts to open the lids, and even in the case of adults it is often quite impracticable under these circumstances. To be effectual irrigation must be thorough, and in the active inflammatory stage it should be repeated, at least, every half-hour. When we realize the difficulties of perfect cleansing in hospital cases, how much more are they augmented in dispensary and private cases, in which the operation is left to inexperienced members of the patient's family? Yet it is our duty to persist with the greatest patience, and under all disagreeable circumstances, in thorough cleansing, as therein lies the assurance of success.

What might be called the "golden rule" in these cases, is:
Without careful irrigation, all other treatment is unreliable; with perfect irrigation, other treatment is usually unnecessary.

In the irrigation of the eyes we have had little mechanical or instrumental assistance offered to us. Some surgeons advise against the use of any hard substance in irrigation as they fear injury to the cornea in manipulation. Of the few methods suggested, that of Kalt, with the irrigation-tube, seems to have produced the best results.

We have had made an instrument which seems to answer all the requirements of a satisfactory sulcus-syringe. It is in all essentials simply a lid retractor, such as every one uses in operations and in examining inflamed eyes, etc., but made hollow for the passage of a liquid to all parts of the sulcus. It is perforated at its edges and on both its bulbar and palpebral surfaces, to allow the passage of liquid

through and about it. The small holes are depressed to prevent occlusion by close contact with the conjunctiva, and both services are grooved to allow a drainage flow from the sulcus. There are no ragged edges or protrusions to injure the eye and there is no danger of the fluid being squirted back into the operator's eyes. The re-



tractor may be made of metal or hard rubber. It is best used with a fountain-syringe, the pressure being regulated by the height of the reservoir above the patient's head, the current controlled by a stop-cock, or by pressure on the tubing near the retractor. The instrument is also adapted for adjustment to a hypodermic syringe, having a thread the same size as an ordinary hypodermic needle.

With this retractor-syringe the eye may be easily and thoroughly washed at the shortest intervals, as there is little pain in its introduction. Every twenty minutes is the least interval ever necessary. At least a half-pint of water should be used at each irrigation and during the cleansing the retractor should be moved about slightly in the sulcus. The liquid should be drained over the side of the face into a basin, care being taken that it does not enter the ear, nose or mouth. This is particularly necessary in infants. Any solution may be used, although sterile water, or possibly a weak pure boric acid solution will be found effective. The fluid should be used at body-temperature, unless for special reason the application of heat or cold is desired, which may be readily applied in this manner. The solution, gently run through the syringe, also offers an excellent substitute for wet packs and fomentations in certain cases of ocular inflammation. Thorough applications of such stimulating and astringent solutions as silver nitrate may be made by the retractor-syringe with the hypodermic-barrel attachment. Before and after use, it is of course cleansed and sterilized.

We are indebted to Mess. Jacob J. Teufel & Brother, of Philadelphia, for the manufacture of this instrument, and for the accompanying cut.

ANOPHTHALMOS.

By J. WALTER PARK, M. D.,
Of Harrisburg, Pa.

Ophth. Surgeon Harrisburg Hospital, Childrens' Industrial Home, Home of Friendless.

On February 17th, 1896, a child two weeks old was brought to our city hospital by its parents, both of whom were Austrians; the father was thirty and the mother about forty years of age. The father had normal vision in both eyes, but the mother was highly myopic, with extensive choroidal changes encroaching upon both maculae. She was practically blind. She says she has been so since childhood. The father was fairly intelligent, but the mother was very ignorant. The child was well developed and apparently in good health. The eye-lids were adherent at their margins, with the exception of about one-eighth inch. The canaliculi were absent in both eyes. After giving the child some chloroform I separated the lids and explored the cavities of both orbits, but did not find even a rudiment of a globe.

In looking up the literature upon this subject, I find quite a number of authors who do not speak of it at all. LANG, of London, in *Norris & Oliver's System of Diseases of the Eye*, page 420, says that dissections generally show small rudimentary globes at the apex of the orbit, but also reports ten cases through the *Royal London Oph. Hosp. Repts.* in which no rudimentary globes could be found. Dr. ARTHUR J. GILLETTE, of St. Paul, Minn., wrote to me he had a case of congenital lateral curvature of the spine, which he attributes to intra-uterine rickets, in which there was a congenital absence of the right eye-ball. NOYES, "*Diseases of the Eye*," page 646, reports Haab as having examined an idiotic girl twenty-seven years old, in which the eye-balls were simply rudimentary, the muscles well developed, the optic tract and chiasm were wanting, etc. SCHMIDT-RIMPLER in *Roosa's Translation*, page 535, reports one case in which a small white speck as large as a pea was visible. FUCHS, in his *Text-Book of Ophthalmology*, page 328, seems to think true anophthalmos has not yet been determined. LANG thinks they are rare. I shall be glad to receive reports of all such cases that come under the notice of my ophthalmic friends.

AN OPTOMETRE—A FIXED FORM OF APPARATUS FOR THE TRIAL LENSES, AND FOR THE DETERMINATION OF THE ANOMALIES OF OCULAR BALANCE.

By S. D. RISLEY, M. D.,

Of Philadelphia, Pa.

Attending Surgeon Wills' Eye Hospital; Professor of Diseases of the Eye

Philadelphia Polyclinic and College for Graduates in Medicine

ILLUSTRATED.

The careful study of the abnormalities of refraction and ocular balance, of late years has served to demonstrate not only the inconvenience, but the insufficiency of the trial frame for accurate and scientific work.

The trial frame even in its best forms is not only cumbersome and fatiguing to the patient, but in the selection of cylindrical glasses leads to frequent and almost unavoidable error in ordering the degree at which the cylinder axis should be placed, since resting as it must do upon the patient's nose and ears, its frame necessarily conforms to the irregularities of the skull.

It is not exceptional to find one ear higher than its fellow, or variations in the conformation of the face, which may easily mislead the surgeon in estimating the position of the frames in their relation to a horizontal line. I have convinced myself that it is very easy to make an error of ten or more degrees in my estimation of the position of the trial frames. That is to say, when the trial frame seemed by ordinary observation to occupy a horizontal position, an error was shown as soon as an accurately leveled bar was thrown in front of the patient's face. Since the degrees on the arc of the trial frame are measured from the horizontal line, it is obvious that this line must be maintained in order to avoid error. If the horizontal line deviates one or more degrees, the error is necessarily transferred to all the readings on the arc of the frame. It is quite possible, for example, to order the axis of a cylinder at 90° , or vertical to a horizontal line, when it should be placed at 80° or 100° , i. e., 10° one way or the other from the vertical, an error quite sufficient to cause trouble in many cases. If, however, the frames, when at rest, fit satisfactorily, the pressure of the finger in rotating the cylinder in the frame may very easily cause many degrees of deviation.

It is essential therefore for the accurate determination of the exact degree at which the cylinder axis should be placed, to have some fixed form of apparatus so that the horizontal line may be accurately determined and maintained. This is however of minor importance when compared with the errors occasioned in the effort to measure the binocular balance. I have elsewhere (*University Med. Mag.*, Jan. 1895)

urged the important relation existing between the anomalies of refraction and ocular balance, and that the latter could be determined accurately only through the careful optical correction of the former. Now to this end it is highly important that the optical centres of the correcting glasses should coincide with the pupil of each eye, both vertically and horizontally. Otherwise the prismatic effect of decentered glasses reveals itself in apparent anomalies of ocular balance, or may conceal existing defects by a partial or total prismatic correction.

It is difficult or impossible to place or remove prisms from the trial frame without at the same time causing certain additional results from a temporary decentring of the correcting glasses.

In the determination of the lateral balance, or the power of the external or internal recti muscles, this may not be of serious importance, since the great strength of these (as compared to that of the vertically acting muscles) makes less relative error, but in the use of the stronger prism necessary to determine the strength of the horizontally acting muscles it is even more important that the horizontal line should be maintained, since the inclination of the base, upward or downward, has the effect of a prism placed vertically.

To avoid these errors it is essential, as Dr. Stevens has also urged, that a fixed apparatus should be employed. The apparatus here presented was devised in its simpler and earliest form in 1874, and a description published in the (*American Journal of the Medical Sciences*, for October, 1875.*

It has been modified from time to time, to meet the requirements of added experience, and to secure additional convenience.

In its present form it is firmly fixed to the arm of a comfortable chair, or may be adapted to a firm floor-stand which may rest at the side of the chair occupied by the patient. The bar which supports the holder or frame for the trial glasses, rotary prisms, stenopaic slit, Maddox rod, diaphragm for correction of high myopia through dilated pupils &c., swings on a vertical shaft to the front of the patient, and may be adjusted at any required height.

The holders are centered by a double-acting screw. A weighted pointer moving over a segment of a circle, fixed to the base line of the holders, enables the observer to accurately determine that the holders are level, this being effected by a leveling screw.

The rotary prisms devised by the writer (*Trans. Amer. Oph. Soc.* 1889) is adjusted in a special cell for its reception, which turns aside out of the way when not in use, but is readily turned back before the correcting glasses when required.

*"A new Optometer for measuring the Anomalies of Refraction and Field of Vision," by S. D. Risley, M. D.

For rapid work one of these prisms should be placed on each side, one with its zero point placed at 0° on the trial frame or holder, the other at 90° .

A bar graduated in centimetres half a metre in length is attached to the front of the apparatus, carrying the test cards for work at the near point, and for determining the range of accommodation. This may be turned aside when not in use.

The accompanying cut makes any extended description unnecessary.



Fig. 1.—The Optometre *

A series of cells are so adjusted to the holders as to be rapidly turned into place before the eye, or turned aside when not required. Any test object which can be made to fit in an ordinary trial glass cell can be placed in these adjustable parts of the holder, e. g., the Maddox rod or the double prism, or a stenopaic slit.

The anterior one is designed especially for the rotary prism. An additional arm contains a grooved wheel or pulley, the groove being fitted with a rubber band. This is designed to rest upon the rim of

* The apparatus is manufactured by the Fox Optical Company Philadelphia, while the rotary prism is now made by many of the leading optical firms.

the cylinder cell, then turning the wheel by contact with the finger the cylinder is rotated before the eye with greater facility than with the finger in contact with edge of cell itself. The writer prefers to use cylinders without a handle to the containing cell.

The posterior surface of the holders, that is to say the side nearest the eye of the patient, is converted into a complete circle by flat graduated rings, through which the patient must look. These, to-



Fig. 2 — Rotary Prism.

gether with the test glasses, or other objects which fit in the grooves in the holders, give rise to the same effect as is secured by looking through a tube, as, e. g., that of a microscope or opera glass, the field appearing as a circular disc.

The conditions thus secured are unusual and remove in a large measure the temptation to neutralize existing defects of refraction by accommodation, or to overcome by the accustomed muscular tension the abnormalities of ocular balance.

This apparatus has been in constant use in my work for a long time. It is therefore with the conviction that it will prove of service to others that it is once more presented to my colleagues.

I can but think that the exercise of a little patience, until one becomes accustomed to the employment of a new instrument will demonstrate the claim that is made for the Optometre, viz: that it is more convenient than trial frames, and also a means of securing greater accuracy in the study and treatment of a very troublesome group of patients.

STRABISMUS DUE TO UNDEVELOPED OR CONTRACTED CHECK LIGAMENT, AND OPERATION FOR ITS RELIEF.

BY JOSEPH ELLIOTT COLBURN, M. D.

Professor of Ophthalmology in the Chicago Polyclinic.

ILLUSTRATED

The eye is suspended in the orbital cavity, and held in place by two classes of tissues.

1st. The dynamic—the recti, and oblique ocular and orbicular muscles.

2nd. The static—the capsule of Tenon, the check ligament; orbital fat and orbital connective tissue.

The recti muscles together with the lids serve to hold the eye firmly against the supporting or suspensory structures, as well as to direct their movements. The capsule of Tenon serves as a socket in which the eye may rotate, and the orbital facias, (one division of which is the check ligament) connective and adipose tissue serving as a supporting, restraining bed in which it rests.

To understand the *special bands* mentioned above, we must follow the sheath of each muscle forwards, when we find that, while it is rather loosely applied to the muscular belly in its posterior two-thirds, it then suddenly becomes thicker and is firmly attached to the muscle for some distance before finally leaving it, and is thereafter often accompanied by some muscle-fibres. The best developed of these bands, the *external check ligament*, passes forwards and outwards to the outer angle of the orbit, helping to support the lachrymal gland on its way, and is inserted near the orbital edge immediately behind the external palpebral ligament. The inner band, or *internal check ligament*, is larger than the outer, but not so thick; it passes forwards and inwards into the upper part of the lachrymal crest and just behind it. These two bands, external and internal, come from the sheaths of the corresponding recti muscles. From the sheath of superior rectus come two thin bands, one from each border. The inner joins the sheath of the tendon of the superior oblique; the outer goes to the external angle of the orbit, assisting in the support of part of the lachrymal gland. The sheath of the inferior rectus is thickened in front, and, on leaving the muscle, goes to the middle of the inferior oblique, splitting to enclose it; it then passes to be inserted into the lower inner angle of the orbit close behind its margin about midway between the internal check ligament and the orbital attachment of the inferior oblique."

—Morris' Human Anatomy

The relative positions of the two eyes may depend upon the bony structure of the orbit and the development of the orbital soft structures.

The relative or coordinate movements depend upon the neuromuscular status of the dynamic system of the eye, and upon the modifying influence which the facias exert, as they may be normal or abnormal in development.

The development of the bony structures forming the boundaries of the base of the cavity of the orbit seems to modify the development of the orbital facias and their relation to the eyeball, as convergent squint and exophoria, when the plane of the outer canthus is far posterior to that of the inner canthus, or the base of the orbital cavity at a greater angle to the plane of the face. It is my purpose, in a later paper, to tabulate and report the results of my examinations in this direction, both in manifest and latent errors.

Strabismus may be due to:

- 1st. Faulty or atypic bony development.
- 2nd. Faulty or atypic development of the soft structures.
- 3rd. Faulty or atypic development of the motor oculi muscles.
- 4th. Over or under stimulation of the motor centers of the recti muscles resulting from errors of refraction or imperfect coordinating impulse, and as a result, thickening and contraction of the facias, receiving their nutrition and nervation from a common source.

5th. Lowered visual acuity, or interference spots in the media.
Or any or all of the above conditions combined.

Coordinate movements of the eyes may never have taken place, or having taken place, may, from some change in development or conditions, become periodically or permanently interrupted.

The four cases to which I desire to call your attention, belong to the class,—*strabismus due to faulty development of the static soft structures*.

CASE I: Mr. F., aged 29 years, myopic,—13 D., \ominus —3 D. cy., ax 180. Vision = $\frac{2}{3}$; convergent strabismus = 45° ; limited outward rotation of both eyes, the right eye giving only 15° to temporal side of median line, the left eye from 5° to 10° ; 4° of left hyperphoria. Every act of remote fixation was followed by pain, lachrymation, mental confusion and vertigo. Proximal fixation was accomplished with comparative ease, with—4 D. lenses; conscious at all times of double vision. When walking, driving or generally employed, closed alternately right or left eye according to the line of fixation, and posed the head to favor the convergence of the fixing eye.

Inspection: Head fixed with face in plane of body, and erect. Right eye deeply set, lids small, aperture short and upper lid drooping, while lower lids showed $\frac{1}{8}$ inch of sclera below the cornea. The eye responded promptly to the outward rotation up to the point of limitation, 15° , then made several jerky movements and fell back to the median line.

Left eye somewhat larger in aperture; the upper lid did not droop and the lower just reached the lower margin of the cornea; movements to the temporal side gave about the same nystagmic spasms as did the right. Red glass, 4° hyperphoria. Javal, O. D., 1.50 D. 90; O. S. 1.50 D. 75.

Correction, R.—13 D. \bigcirc —3 cy., ax. 180.

L.—13 D. \bigcirc —3 cy., ax. 15.

Ophthalmoscope: small cornea; large post-staphyloma; small choroidal scars; macula normal and retina unchanged in its immediate area. When the eye was strongly rotated to the temporal side, the inner canthus was raised and tense, and seemed to restrain the movement of the eye beyond a certain point. Operation for relief successful.

CASE II: M. C., female, aged 21. Compound hypermetropic astigmatism=2S \bigcirc —1.75, cy. 90 each eye; vision= $\frac{2}{5}$. Habitual pose of the head to the right side; convergent strabismus, right eye fixing, 60°; rotation outward toward temporal side to median line only.

The eyes were cocainized and forced abduction attempted. This was successful only in part, as the eye could not be drawn to 25° abd. The voluntary effort of abduction then gave 10° to temporal side of median line.

This patient, also, used right and left eye alternately according to the field of fixation. There was nothing unusual about the conformation of the lids or outward manifestation of the bone structures. Any attempt to rotate the eye outward was accomplished by pain, nervous dread and working of the muscles of expression. The right eye was used when walking, riding or driving; the left for reading, writing or any close work. The patient had been subject to headaches, almost daily, from childhood. The correction of the error of refraction was followed by complete relief. There had been no change in the amount of squint. The relief sought, was for improving personal appearance. The result of the operation, hereafter described, was perfect binocular fixation through the normal range.

CASE III. A. F., female, aged 22 years, strabismic at birth. Tenotomies and advancements were made one year before coming to my clinic (1894) without favorable results. Plane of base of the orbital angle, 15°.

R vision= $\frac{3}{10}$ with + 2 D.; L. vision= $\frac{2}{4}$ with + 4 D

Right eye fixing, head posed to the right allowing 30° convergence with left cornea at inner canthus. The right eye was used for the entire range. The left eye could only be forced to 40°, with right eye covered. She had never been able to rotate the left eye outwards.

October 12, 1895, operated upon right eye correcting all but 29°. October 20, found 40° convergence in left eye; right eye mobile and fixing at median line. At this date corrected the balance of the error, as described in latter part of paper.

The result in this case was a slight divergence of 10°, which manifested itself 4 or 5 months after the last operation. This was corrected by relieving the externus of the left eye, as an error had been made by advancing it too much.

CASE IV. Miss G., aged 19, was referred to me by Dr. H. P. Newman, August, 1893. Marked strabismus; habitual fixation with right eye; vision normal. The contour of the face and head, symmetrical; eyes rather deeply set; plane of base of orbit formed an angle of 10°. Right eye fixing, left eye converged to 65°; left eye fixing, right eye converged to 40°. The head habitually posed towards the right side, allowing for fixation at 22° convergence. Forced abduction of either eye would scarcely bring eye to median line. Most comfortable vision was obtained by throwing the head slightly backwards and to the right. For proximal

fixation the eyes were used alternately according to the field desired; was never conscious of double vision.

Following the operation, as described later, there was great difficulty in securing coincident consciousness of binocular fixation, though perfect position was secured.

After some months, consciousness of the second image could be realized, and binocular fixation was obtained throughout the normal range.

Strabismus, in this class of cases, is not due primarily to too short internal recti or insufficient external muscles, but to a contracted or undeveloped internal check ligament, restraining the abductors in their attempt to produce parallelism, or to rotate the eyes through their entire lateral range.

Two of these cases were hypermetropic one myopic and one emmetropic; all were cross eyed at birth and never practiced coordinate fixation. All were conscious of the sensation of being eye-tied, and of the relief following operations, according full range of rotation without change of the position of the head for any part of the normal field.

OPERATION: Enter the conjunctiva just to the canthus side of the rectus muscle attachment. Incise the tendon, as indicated in plate I, A, taking care not to extend the cut in the conjunctiva and orbital fascia beyond the cut of incision, this can be done by having an assistant hold the tissues out of the way till the tenotomy is completed. Now grasp the conjunctiva and fascia, and extend the incisions upwards and downwards to the extent of 2 to 5 m. m. (Plate III., a. b.) cut through the check ligament as described by *line of incision*, (A. in plate II.) Bring angles A. and B., including conjunctiva and orbital fascia (sub-conjunctival layer of check ligament) together with a suture, and tie, with result as indicated at C. plate III; make measurement of the operation up to this point, and, if necessary, advance the opposing muscle to secure the desired result.

The operation for advancement referred to is the one described by Doctor Stevens, and indicated at B. plate I.

(Plates on page 32.)

PLATE I

- A. Line of incision in graduate tenotomy.
 B. Advancement of tendon.
 b. Excised portion of tendon.
 S. S. Sutures.

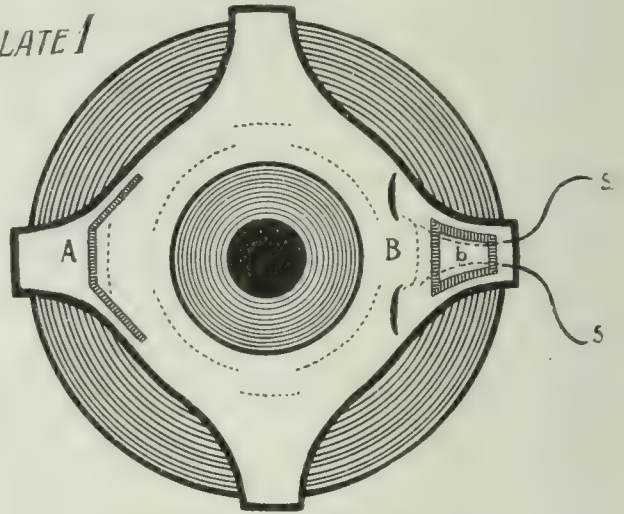
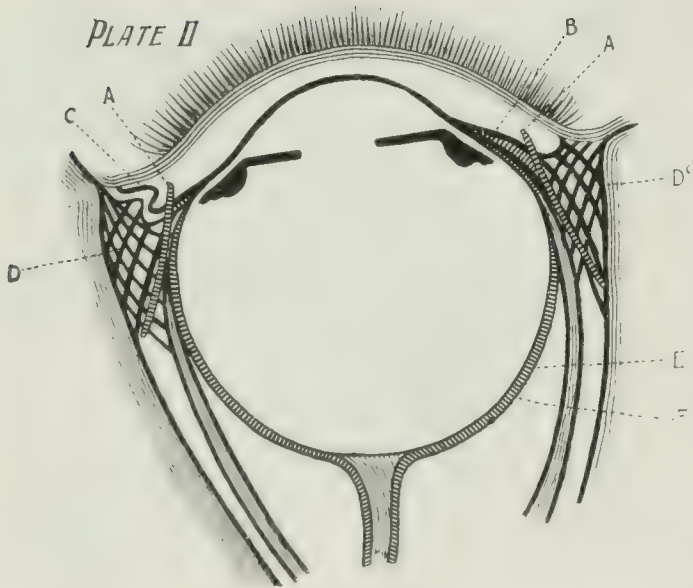


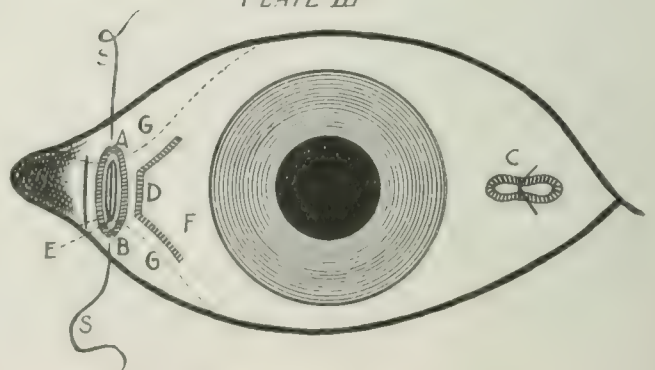
PLATE II



- A. A. Lines of incision.
 B. Conjunctiva.
 C. Plica Semilunaris
 D. Internal Check Ligament.
 Dd. External Check Ligament.
 E. Space.
 F. Tenon's Capsule.

- A } Incision through conjuncti-
 B } va and check ligament.
 C. Result of bringing A and B
 together with a suture.
 D. Lines of cut in tendon.
 E. Check Ligament.
 F. Conjunctiva.
 G. Expansion of tendon, inter-
 nal rectus.
 S. S. Sutures.

PLATE III



CORRESPONDENCE

THE OPHTHALMIC RECORD.

1102 RELIANCE BUILDING.

T. A. WOODRUFF, M. D.,
EDITORIAL SECRETARY

CHICAGO, November 24th, 1896.

THOMAS A. EDISON, Esq., West Orange, N. J.:

DEAR SIR: Having seen in the newspapers several accounts of investigations made by you upon the blind with the Roentgen ray, we take the liberty of addressing you with a view of securing some definite knowledge of the work you have done in a department that is of interest to Ophthalmologists, and beg to ask you for a paper on the results of your investigations for the January number of the OPHTHALMIC RECORD. Such an article would be read with much interest by Ophthalmologists throughout the country.

An early reply will greatly oblige.

Yours very truly,
T. A. WOODRUFF.

CABLE ADDRESS FROM THE LABORATORY
"EDISON, NEW YORK" OF
THOMAS A. EDISON.

PHONOGRAPH DICTATION.

ORANGE, N. J., Dec. 15, 1896.

DR. T. A. WOODRUFF, 1102 Reliance Building, Chicago, Ill.:

DEAR SIR: In reply to your favor of the 24th ult., I beg to state that in the course of experiments I only made the observation that one blindfolded can see with the X ray. I do not want to go into the subject any further as it is out of my line.

Yours truly,
THOS. A. EDISON.

TO THE MEMBERS OF THE MEDICAL PROFESSION.

I would be pleased to have an expression from you, either personally or through some medical journal, as to the relations of the lay-publishing firms of medical journals and the profession. The request is suggested by the fact that Messrs. Wm. Wood & Co., of New York, refuse to permit the editors of "The American Year-Book of Medicine and Surgery" to use in our abstracts of Medical Progress articles and illustrations first printed in the "Medical Record" and the "American Journal of Obstetrics."

This decision seems to me to be wrong for the following reasons:—

1. IT PREVENTS THE DISSEMINATION OF MEDICAL KNOWLEDGE. The Year-Book condenses, systematizes, and criticises the year's medical work in a shorter space and more permanent manner than the journals, and has thousands of readers no single journal can claim or hope to reach. Every physician writes and publishes articles in order that every member of the profession may, if possible, learn of his work, and that science and progress may thus be furthered and humanity benefited. To interfere with such dissemination of our literature in publications is, I think, discourteous and unjust to the profession and an injury to Medical Science.

2. This injustice and injury to Medicine becomes all the more striking when physicians do not receive a cent of pay for contributions, from the publication of which the lay-publisher is supposed to make considerable financial profit.

3. No other publishers in the world, not even those who pay authors for their contributions, have in the least objected to our reproduction of quotations, abstracts, and illustrations from their journals.

Do you wish to limit the dissemination of your contributions to Medical Science by such an exclusion of them on the part of publishers from reputable publications? IS THIS LITERATURE THE PROPERTY OF YOURSELF AND OF THE PROFESSION OR NOT? Does your gift of it to a journal make it the private property of the publishers of that journal? Is it not rather a loan for temporary use only?

Will you not hereafter demand that there be printed with your article that the right of abstracting the text or reproducing illustrations is guaranteed?

Sincerely yours,

GEO. M. GOULD.

119 S. 17th Street, Philadelphia, Pa.

Dec. 1896.

REVIEWS.

Some Preliminary Experiments on Vision without Inversion of the Retinal Image. — By Dr. George M. Stratton, University of California. *The Psychological Review*, November, 1896. Page 512. This interesting paper, read at the Third International Congress for Psychology at Munich last August, records an investigation of what has long been regarded as a fundamental proposition in physiologic optics. Prof. Stratton first states the two principal theories of upright vision. The first, which he refers to as the projection theory, assumes that objects are projected into space in the directions in which the rays of light fall upon the retina. The crossing of these lines of direction within the eye requires that if the subject is to be projected right side up the retinal image must be inverted. The second theory, which may be termed the eye movement theory, holds that the movements of the eye and our perception of the direction of such movements are the means by which we judge of the spatial relation of objects in the visual field. Upper and lower, according to this theory, mean positions which require an upward or downward movement of the eye to bring them into clear vision. But an upward movement of the eye brings into clear vision only what lies below the fovea on the retina. So that here too the perception of objects as upright requires that their retinal images be inverted.

Is the inverted image a necessary condition of our seeing things in an upright position? The method of approaching the problem was to substitute an upright retinal image for the normal inverted one and watch the result.

This was done by binding on the eyes a simple optical contrivance constructed on the following principle: If two convex lenses of equal refractive power be placed in a tube at a distance from each other equal to the sum of their focal distances, the eye in looking through the tube sees all things inverted, but in other respects the image remains unchanged. The image cast on the retina is as if the whole field of view had been revolved on the line of sight through an angle of 180°. All light other than that which comes through the lenses must, of course, be carefully excluded by making the instrument fit exactly the inequalities of the face by means of black linings and pads. For if light were permitted to enter the eyes otherwise than through the lenses, the observer would be subjected to both upright and inverted images, and the purity of the experiment would be lost.

Inasmuch as the size of the visual field was of considerable im-

portance in the experiments Stratton first used large and thick lenses but these were found to be too heavy for long-continued wear, so he substituted for each of the lenses in the tube *two* double convex lenses, placed close together on the same axial line. In this way before either eye was a tube containing a pair of good lenses of equal focal length giving a clear visual field with a compass of 45° . The instrument can then be worn without discomfort.

The experimenter now discovered however, that his scheme to employ binocular vision was impracticable owing to the strain upon his convergence and so was obliged to use but one eye, the other being covered with a black shade.

The instrument was bound upon his face at 3 o'clock in the afternoon and worn without pause until 10 in the evening. The eyes were then closed, the instrument removed and a bandage placed over the ocular region.

Next morning at 9.30 the lenses were again carefully adjusted to the closed eyes and again worn until ten o'clock p. m. On the third day the instrument was worn until noon and then removed. In all the lenses were continuously worn while the eyes were functioning for $21\frac{1}{2}$ hours.. This was freely admitted by Dr. Stratton to be too short a time to expect pronounced results in breaking a life-long and inherited habit but from certain indications the writer felt justified in prophesying what would result if the time consumed in the experiment had been much more prolonged. The time was spent entirely indoors, watching the scene on the street below, watching the movements of feet and hands, experimenting on the changes which occurred in the visual field in connection with particular movements of the head or of the whole body, grasping and handling seen objects—in short trying to crowd as varied an experience as possible into the brief time at my disposal.

The experience that followed the wearing of the instrument just described and the deductions that the experimenter drew from it are as follows: All images at first appeared to be inverted; the room and all in it seemed upside down. The hands when stretched out from below into the visual field seemed to enter from above. Yet although all these images were clear and definite, they did not at first seem to be real things, like the things we see in the normal vision, but they seemed to be misplaced, false or illusory *images* between the observer and the objects themselves. For the memory-images brought over from normal vision still continued to be the standard and criterion of reality. The present perceptions were for some time translated involuntarily into the language of normal vision: the present visual percep-

tions were used simply as signs to determine how and where the object would appear if it could be *seen* in one way and *thought of* in a different way. This held true *also* of anybody else, for the parts of my body were *felt* to lie where they would have appeared had the instrument been removed; they were *seen* to be in another position. But the older tactual and visual localization was still the *real* localization.

All movements of the body at this time were awkward, uncertain, and full of surprises. Only when the movement was made regardless of visual images, by aid of touch and memory alone—as when one moves in the dark—could walking or moving of the hand be performed with reasonable security and directness. Otherwise the movement was a series of errors and attempts at correction, until the limb was finally brought into the desired position in the visual field. The reason for this seems partly to have been that the reconstruction of the visual field in terms of the normal visual experience—the translation before spoken of—was never carried out in all the details of the picture. In general, or in the main outlines, things might be referred to the positions they would have in normal vision, but the new visual field was in many details accepted just as found, and was acted upon without any translation whatever. So that when movements were made as if the visual signs meant just what they had meant in normal vision, the movements of course went astray. The limb usually started in the opposite direction from the one I really desired. Or when I saw an object near one of my hands and wished to grasp it with that hand, the *other* hand was the one I moved. The mistake was then seen, and by trial, observation, and correction, the desired movement was at last brought about.

As I moved about in the room, the movement of the visual images of my hands or feet were at first not used, as in normal vision, to decide what tactual sensations were to be expected. Knocks against things in plain sight were more or less of a surprise. I felt my hand to be in a different position from that in which I saw it, and could not except by cool deliberation, use its visual image as a sign of impending tactual experience. After a time, however, repeated experience made this use of the visual image much less strange; it began to be the common guide and means of anticipation. I watched my feet in walking and saw what they were approaching, and expected visual and tactual contact to be reported perceptually together. In this way the limbs began actually to feel in the place where the new visual perception reported them to be. The vivid connection of tactual and visual perceptions began to take away the overpowering force of the localization lasting over from normal vision. The seen images thus became *rai*

things just as in normal sight. I could at length *feel* my feet strike against the *seen* floor, although the floor was seen on the opposite side of the field of vision from that to which at the beginning of the experiment I had referred these tactual sensations. I could likewise at times feel that my arms lay between my head and this new position of the feet; shoulders and head, however, which under the circumstances could never be directly seen, kept the old localization they had had in normal vision, in spite of the local difficulty that the shape of the body and the localization of hands and feet just mentioned made such a localization of the shoulders absurd.

Objects lying at the moment outside the visual field (things at the side of the observer, for example) were at first mentally represented as they would have appeared in normal vision. As soon as the actual presentation vanished, the new relations gave way to the old ones brought over from the long former experience. The actual present perception remained in this way entirely isolated and out of harmony with the larger whole made up by representation. But later I found myself bringing the representation of unseen objects into harmonious relation with the present perception. They began now to be represented not as they would appear if normal vision were restored, but as they would appear if the present field of vision were widened or moved so as to include them. In this way the room began to make a whole once more, floor and walls and the prominent objects in the room getting into a constant relation to one another, so that during a movement of the head I could more or less accurately anticipate the order in which things would enter the visual field. For at first the visual search for an object outside of the immediate sight was quite haphazard; movements were made at random until the desired object appeared in sight and was recognized. But now the various lines of visual direction and what they would lead to were more successfully held in mind. By the third day things had thus been interconnected into a whole by piecing together the parts of the ever changing visual fields.

As the relation of the visual field to the observer, the feeling that the field was upside down remained in general throughout the experiment. At times, however, there were peculiar variations in this feeling according to the mental attitude of the observer toward the present scene. If the attention was directed mainly inward, and things were viewed only in indirect attention they seemed clearly to be inverted. But when, on the other hand, full attention was given to the outer objects, these frequently seemed to be in a normal position, and whatever there was of abnormality seemed to lie in myself, as if head and

shoulders were inverted and I were viewing objects from that position, as boys sometimes do from between their legs. At other times the inversion seemed confined to the face or eyes alone.

On removing the glasses on the third day there was no peculiar experience. Normal vision was restored instantaneously and without any disturbance in the natural appearance or position of the objects.

The experiment was of course not carried far enough to see the final aspect the experience under these conditions would assume. But the changes which actually occurred, even the transitory feelings the observer at times had, give hints of the course a longer experiment of this kind would take. I might also say that the main problem—that of the importance of the inversion of the retinal image for upright vision—had received from the experiment a full solution. For if the inversion of the retinal image were absolutely necessary for upright vision as both the projection theory and the eye-movement theory hold, it is certainly difficult to understand how the scene as a whole could even temporarily have appeared upright when the retinal image was *not* inverted. As was said, all things which under the conditions could be seen at all repeatedly appeared to be in normal relation; that is, they seemed to be right side up. Only certain parts of the experience (i. e., head and shoulders), upon which under the circumstances vision could give no report at all, because these parts could not be brought directly into the visual field, seemed to be in abnormal relation to the scene. That these parts of the body should have stubbornly refused to come into harmony with the new arrangement is easy to explain. The only visual experience I have had of them was the *normal* visual experience, and this remained firm in memory without the possibility of displacing it by repeated contradictory visual perception under the new conditions. But of those parts of the body which could be seen, the new appearance and localization was able to drive the old from the field, because the new localization by sight showed a perfect and constant relation to the reports by muscular and tactual perception. No doubt the merely tactual experience of the unseen parts of the body and of their relation to the seen parts must inevitably have produced in time a new indirect visual representation of these unseen parts which would displace the older representation brought over from normal vision. The gradual organization of the whole experience would certainly produce this result, although it would undoubtedly require more time in the case of the unseen parts of the body than in that of the parts plainly visible.

In fact, the difficulty of seeing things upright by means of upright retinal images seems to consist solely in the resistance offered by the

long-established previous experience. There is certainly no peculiar inherent difficulty arising from the new conditions themselves. If no previous experience had been stored up to stand in opposition to the new perceptions, it would be absurd to suppose that the visual perceptions in such a case would seem inverted. Any visual field in which the relation of the seen parts to one another would always correspond to the relations found by touch and muscular movement would give us 'upright' vision, whether the optic image lay upright, inverted, or at any intermediate angle whatever on the retina. Only after a set of relations and perceptions had become organized into a norm could something enter which was in unusual relation to this organized whole and be (for instance) upside down. But a person whose vision had from the very beginning been under the conditions we have in the present experiment artificially produced, could never possibly feel that such visual perceptions were inverted.

We trust that Dr. Stratton will pursue this important investigation—of especial interest to students of optical physiology and the psychology based upon that study.

CASEY WOOD.

Study of Ophthalmological Geography as Regards Trachoma. Chibret (Clermont Ferrand.) *Report to the French Ophthalmological Society*, 1896. This report embodies a continuation of the researches of Chibret which he began fully sixteen years ago and which were the subject of his communications to the two international congresses of Copenhagen (1884) and Berlin (1890). Hence his unanimous choice by the committee of the French Ophthalmological Society as chairman of a commission upon the broad subject of Ophthalmological Geography, the object of which is to establish among other things, the laws governing the distribution, etiology and receptivity of eye diseases. Seventeen collaborators were chosen by the Society from different countries as associates of Chibret in his labors, and to each he addressed a circular setting forth the information necessary for the elaboration of a report, and expressing his intention of limiting the question to the geographical distribution of trachoma and the causes governing this distribution. He chose trachoma as the first subject of inquiry because, as he states: "In this I have imitated the example of the bacteriologists; they, at the outset, confined all their efforts to the study of anthrax, making it 'the microbic disease-type', and it has been the source of fundamental ideas. * * * The immunity of the Algerian sheep to anthrax, which could not be forseen, has always seemed to me very suggestive as regards human pathology." He directed his collaborators to group their answers and observations under three principal heads: 1st, The germ or unknown microbe, whether they admit its virulence; the pathologic cell, whether they deny its contagiousness and therefore its virulence. 2nd, The soil (*terrain*); embracing race, occupation, alimentation and temperament. 3rd, The Meteorological conditions, including the influence of the atmospheric pressure, temperature, hygrometric condition and insolation, (exposure to direct sunlight. Rev.). Of the seventeen collaborators officially associated with Chibret only two, Dr. Foucher of Montreal, and Dr. Sulzer of Geneva, responded! Drs. Hirschberg (Berlin), Dianoux (Nancy), Bribosia (Namur), Samelsohn (Cologne), and Swan Burnett (Washington) were volunteers enrolled by the reporter, and all replied:

The limits of this review permit only of gleanings from the report, which is eminently creditable to the scientific enthusiasms and industry of its author.

1st. *Germ, Pathologic Cell, Contagion, Virulence.* Foucher (Montreal) agrees with Dianoux in considering the microbe of trachoma as closely related to the bacillus of Koch, and Burnett while he is not convinced of its contagiousness, believes with Dianoux that the infectious matter germinates according to the fertility of the conjunc-

tival soil, and that at first a simple conjunctivitis, it can lead to the development of trachoma in a predisposed eye. None of the reporters or their collaborators connect the trachomatous virus with that of blenorrhœa, though (as is well known) Fuchs does, while Chibret among other facts, cites the immunity of the Canadian Indians to trachoma, who nevertheless have none for blenorrhœa. All the observers distinguish follicular conjunctivitis from trachoma, the latter being the sole form resulting in conjunctival atrophy. Some deny anatomo-pathologic differences, but all agree in differentiating the two affections clinically, notwithstanding the former can lead to the latter. "Well attested facts of contagion are rare in America; the majority of the observers are virtually obliged to admit contagion without being able to furnish precise and demonstrative observations. ***Several observers after having noted the non-contagiousness of trachoma in families, mention with astonishment cases where the affection has remained monocular for many years. These cases, in my opinion come under the law of "*atténuation de passage*." Chibret, Bribosia and Samelsohn regard vernal catarrh, like follicular catarrh, as "the clinical expression of the attenuation of trachoma," though it is difficult to reconcile this view with a case of vernal catarrh cited by Chibret which he cured by correcting a high degree of astigmatism, and which he nevertheless maintains is only evidence that sometimes vernal catarrh may arise from other causes than the attenuated trachoma virus!

2nd. *Soil (terrain), Race, Occupation, Alimentation, Temperament*, Chibret rehearses the well-known fact that in 1876 Swan Burnett first showed by statistics the rarity of trachoma among the negroes of North America, and hence the immunity of the black race. In 1890 Chibret himself established the immunity of the Celts of Broca. Although the facts advanced by Burnett were very inconsiderately contradicted in Chibret's opinion by van Milligan, *(Constantinople), who bases his denial upon the fact that negroes are sometimes attacked in America, and very often in Constantinople. *** "the report of Burnett evidently demonstrates that not only in Washington where he observed, but in all parts of the United States, the black race enjoys an immunity relatively to the white race." This immunity, Chibret believes cannot be due either to the inferior social condition of the negroes nor to the identical meteorological conditions of the whites and blacks, hence it is certainly due to race. As explaining the disagreement between van Milligan and Burnett, Chibret points out that the negroes of America were imported from the West coast of Africa, while those of Constantinople came from the North-east of Africa, and are an

* Burnett in replying to van Milligan, (Ann. d'ocul., cxv. p. 114) remarks that statistical investigations on trachoma are under the disadvantage that different authors call different conditions trachoma. *Net.*

impure race, mixed Semetic (*matinee de semite*), a very receptive race, while the American negroes are of a very pure race, or mixture of white races very slightly receptive. The immunity of the American negroes is not absolute, but relative.

Foucher on the other hand establishes an *absolute* immunity which can be due only to race, viz: that of the the Indians of Canada. Neither Foucher nor the six specialists consulted by him have ever observed a single case of trachoma among the Canadian Indians, although these are insufficiently nourished, idle, slovenly, etc., while syphilis, tuberculosis and eruptive affections decimate them. In Manitoba the Crees' and Sautaux live close to the Russian Mennonites in the same contempt of hygiene; yet while the latter are ravaged by trachoma and many of them blind from it, the Indians remain unaffected, though they are as slovenly as the other Indians, and contract syphilis and tuberculosis.

Although the Indians of the United States are subject to trachoma, Chibret finds in this fact only a corroboration of the doctrine of race immunity, since the Indians of Canada and Pennsylvania are a different race from those of the other Indians of North America, and he thinks that information regarding the Pennsylvania Indians would prove them to be immune, though Burnett has not yet furnished it.

Chibret concludes then, that there are three immunities of race: 1st, The absolute immunity of the Canadian Indians; and 2nd, the relative immunity of the North American Indians; and 3rd, the relative immunity of the race of Celts of Broca.

Of the eminently *receptive* races, the evidence of Santos Fernandez (Bavaria), Myashita (Tokio), van Milligan (Constantinople), and of the American observers, Andrews (New York), Eaton (Portland, Oregon), Rivers (Denver), Southard (San Francisco), establishes without doubt that the yellow race is by far the most receptive.

Occupation. Chibret's reporters afford no support to the influence of occupation as regards the receptivity of trachoma.

Alimentation. Neither do they furnish evidence that alimentation has any influence; mentioning only insufficiency of nourishment.

Temperament.—The same as regards temperament.

Meteorological Conditions, Atmospheric Pressure, Temperature, Insolation.—According to the report of Sulzer (Geneva), the Swiss are exempt from trachoma which he attributes solely to altitude. Cold, humidity, absence of insulations are not sufficient to account for this immunity, since these conditions all exist in Ireland and the Baltic provinces. Yet they have their influence, since Rivers (Denver) finds trachoma common in the high but dry, hot, dusty altitude of Colorado:

hence Chibret concludes that altitude has but a feebly immune influence *per se*, but an active one when re-enforced by cold, humidity and absence of dust, as in Switzerland.

Insolation though having an irritating effect on the conjunctiva, only enhances receptivity in such regions as the Rocky Mountains where the air is excessively dry.

Of the seven members of the Society who took part in the discussion following the reading of the report, only one sided with the reporter. Some denied race immunity in spite of the evidence (the force of that which is here given, the reader can judge); others insisted that infection played the principal rôle, and that race had little or no influence. The reading was long, and we think that could they before discussing it with us have read this most admirable report they would have found it difficult to refute, at least the evidence as to immunity of race.

At all events their hasty denials would seem to justify the sarcastic rejoinder of Chibret in closing the discussion. "The receptivity of the human race to new ideas is almost as feeble as that of negroes to trachoma. I have just had a proof of this; for my honorable contraditors have hardly understood the new ideas which I had the honor to present to them.

F. B. EATON.

REPORTS OF SOCIETIES

SECTION ON OPHTHALMOLOGY,

College of Physicians of Philadelphia.

Meeting of the Ophthalmic Section of the College of Physicians of Philadelphia, October 20, 1896.

Dr. William F. Norris, President, in the chair.

Dr. John T. Carpenter, Jr., showed a case of *Recovery from Unilateral Optic Neuritis, Left Eye*. The notes of the case were as follows:—

Anna R., æt. 15, was first seen May, 1895, when glasses were ordered for compound hypermetropic astigmatism O. D. $+ 2.00 = + 1.00c$ $60^\circ V. = 6-VII\frac{1}{2}$. O. S. $+ 1.25 = + 0.75c$ $75^\circ 6-VI?$ The ophthalmoscope showed at this time partial atrophic pallor of optic nerves from macular lesions, almost symmetrically placed and exposing glistening sclera.

The present attack began June, 1896, when after an attack of sore throat with fever, of a few days duration, she noticed a dense fog before left eye, which rapidly increased until seen, July 9, 1896. There was dull headache and ocular fatigue. O. D. $V. 6-VII\frac{1}{2}$ O. S. 6-XIX small print read with O. D. but large type (D = 1.50) scarcely read with O. S. and rapidly fading. Absolute scotoma (central) was found. No peripheral contraction for form or color.

Ophthalmoscope showed typical picture of neuro-retinitis limited to lower half of disc and extending into lower nasal-retinal field. Arteries almost empty, veins engorged and tortuous. Pressure on ball caused no pulsation and entirely emptied the retinal vessels. Several small retinal hemorrhages near the disc with the degenerative changes in the edematous area completed the picture.

The right fundus oculi showed no alteration from the previous condition noted in 1895. There was absolutely no family history pointing to syphilis. She had never suffered from rheumatism nor has there been any menstrual disturbance. Under treatment by potassium iodide, vision is now (three months) O. S. 6 VI ?? D = 0.50 ctm., easily read and no scotoma exists, either for form or color.

The optic nerve, however, shows marked atrophic pallor. The arteries are still smaller than normal, and there is some vascular formation pushing forward from retina into the vitreous at the side of the neuro-retinal lesion. A drawing of the fundus at the time of the neuritis, together with a chart showing the central scotoma, was also shown with the case.

Discussion.—Dr. de Schweinitz described two cases of unilateral optic neuritis. The first occurred in a married woman of forty. The

visual disturbance, beginning with a blur in the center of the right field of vision, rapidly developed into a large scotoma, spreading out almost to the periphery of the visual field, so that within a short time acuity of vision was reduced to bare perception of light. Ophthalmoscopically, there was optic neuritis, the swelling being 3 D., and in the neighborhood of the papilla were a number of flame-shaped hemorrhages. This neuritis was attributed to rheumatism superinduced by wading in a brook when the patient was much overheated. Under the influence of free leeching, salicylate of sodium, and iodide of potassium, improvement rapidly began, and at the end of three months all ocular symptoms had disappeared. Eight years had elapsed since the occurrence of this neuritis without the reappearance of visual disturbances in either eye. Dr. de Schweinitz referred to his case as an exception to those described by Hirschberg, in which primary unilateral optic neuritis of one eye was followed sooner or later by an attack in the second eye.

The second case occurred in an unmarried woman, aged twenty-three, a type-setter by occupation, who presented on the right side a large central scotoma, extensive optic neuritis, and a star-shaped figure in the macula, somewhat resembling the appearance of albuminuric retinitis. Just prior to the attack of blindness, she had suffered from a severe right facial neuralgia attributed to a defective tooth. There was no history of general disease, and physical examination failed to reveal constitutional taint. Syphilis was not demonstrated, but the patient improved rapidly under ascending doses of iodide of potassium. At the end of three months vision was $\frac{5}{20}$, and the neuritis had largely disappeared. Since that date the patient had not been seen, and the subsequent history could not be given. The possibility that the affection was due to a metallic poison was referred to.

Dr. de Schweinitz also described a case of asymmetrical neuritis due to chlorosis of two years standing, with a complete recovery under the influence of iron. The importance of recognizing anemia as a factor in the development of neuritis was referred to; also the danger of delaying the administration of iron, lest an anemic neuritis should be succeeded by a post-papillitic atrophy. As is usual in cases of optic neuritis, the refraction in all of these eyes was hypermetropic.

Dr. G. Oram Ring.—You perhaps recollect two cases I reported at the May meeting of the Section,—one in a woman aged thirty. I at that time referred to the literature and to the work Dr. de Schweinitz had done up to the time of his last publication. The swelling in one case was 5 dioptries; in the other $2\frac{1}{2}$; no macular changes; no retinal

changes of any sort. They improved very rapidly under mercurial inunctions, vision in each case returning to normal.

Dr. S. D. Risley mentioned two cases, both occurring in his private practice. The first was in a man aged sixty, without assignable cause. The swelling resembled the choking of the disc from cerebellar tumor. The veins were enormously dilated, the retina infiltrated, large hemorrhages in the macular region, and the most prominent part of the nerve + 6 D. In the second case, a young woman aged seventeen, the optic neuritis was apparently due to malarial infection, since the corpuscles of Lavernen were found in great abundance in the blood. She recovered with normal central vision, but one quadrant of the field remained blind. A third case with edema and infiltration of the retina is under treatment.

Dr. William Thompson reported a case in a very old man whom he had treated for choroiditis disseminata. He ascribed the cause to a chronic and neglected ozena. Under proper nasal treatment and mercurial inunction, vision that had been greatly reduced was restored to its previous acuity.

Dr. B. A. Randall recalled a similar case due to pyemia of the posterior ethmoidal cells.

Dr. Charles A. Oliver exhibited a case of *Probable Intraocular Growth in the First Stage of Development* in a fifty-six year old man, who, without history of traumatism or any dyscrasia, had complained of progressive and painful loss of sight in the left eye for the past eighteen months, this failure of vision being especially marked in the upper field. The eye was as quiet as its healthy fellow, the only noticeable difference upon close inspection being that its pupil was slightly larger and the iris a trifle sluggish.

Ophthalmoscopically there could be seen a localized, absolutely fixed detachment of the retina which rose abruptly and almost vertically on the temporal side, from the lower portion of the equator of the globe and gradually shelved outwardly and downwardly from a somewhat flattened apex to a series of successive steps on the nasal side.

Eccentric vision was reduced to $\frac{1}{6}$, and the field of vision showed a defect which corresponded with the supposed intraocular mass.

Although the intraocular condition remains apparently nearly the same at present as it did when the patient was first seen, yet, in spite of alternatives, the remaining field of vision has been slightly encroached upon from above. Intraocular tension has never risen, and there never has been any inflammatory reaction. Operation will be deferred until the time that the diagnosis becomes more certain.

Dr. Randall showed a card specimen of an intraocular growth that presented the unusual feature of absence of retinal detachment.

Dr. Edward Jackson called attention to *Two Practical Points about the Corneal Reflex*. The small bright image of the lamp-flame reflected from the cornea, when the ophthalmoscope is used, and formed by rays reflected from about the sight-hole of the mirror to the eye and from the cornea back through the sight-hole, is always seen in the direction of the center of curvature of the cornea. Hence, as the surgeon's eye is moved, or the patient's eye is rotated, the corneal reflex appears to move across the pupil exactly as would an opacity situated at the center of curvature of the cornea, that is, at a point usually about one-half millimeter behind the posterior pole of the lens. The comparison of the relative rate of apparent movement of opacities, situated in this portion of the eye, with the movement of the corneal reflex across the pupil, determines very accurately the depth of such opacities behind the summit of the cornea; since the curvature of the cornea, the length of its radius of curvature, is readily measured with the ophthalmometer.

The second point was, that, in the usual ophthalmoscopic examination by the direct method, the corneal reflex causes a circle of diffusion on the surgeon's retina which interferes with the success of the examination, if the pupil is small. Since the size of this circle of diffusion depends directly on the size of the sight-hole in the mirror, by making the sight-hole small the examination is facilitated. A sight-hole two millimeters or less in diameter was recommended.

Discussion.—Dr. Thomson had used for some years, for the purpose of securing a defined image of lesions of the fundus, instead of a round hole, a slit in the mirror 9 or 10 mm. long and 1 mm. wide, that he had found possessed decided advantages. Recently, however, he had substituted for it the Jackson mirror and testified to its great practical value.

Dr. B. Alex. Randall read a paper entitled *Rhinitis as a Factor in Phlyctenular Ophthalmia, with its Therapeutic Consequences*. Among the many causative factors in phlyctenular conjunctivitis and keratitis, inflammatory affections of the nose must not be ignored; for they can frequently be demonstrated to be of prime importance. In the great majority of cases, hyperemia and oversecretion of the nasal mucous membrane will be found more constant than eczema or any other of the more incidental accompaniments; and treatment limited to this alone will often bring a cure quicker than could be gained by any local measures without it. Elaborate apparatus and skill are uncalled for. Mere illumination of the nares will usually show the condition, and simple sprays of alkaline and of oily solutions can do much to re-

lieve it. Calomel insufflation can be more valuable than in the conjunctiva, and, instead of the iodine being a bar to its use, its combination with mopping the pharyngeal vault with iodine can be especially efficacious. The ophthalmologist must not neglect this field, which used to be his; and, unless he has some one at hand, better prepared than himself, to give it due care, should stand ready to study and treat in his patients these simpler nasal affections.

Discussion.—Dr. Ring has, for nearly two years, referred nearly all cases of phlyctenular conjunctivitis treated in his clinic at the Episcopal Hospital, to the Throat and Nose Department for nasal treatment.

Dr. Risley has been well satisfied with the results of rhinological treatment of obstinate cases.

Dr. de Schweinitz considers that in all the cases attention should be drawn to the condition of the nares. In his public clinics, when immediate nasal treatment was impracticable, he has sterilized the nose as well as the eye by the simple remedies that he kept on hand for the purpose, and the results had been the happiest.

Dr. Risley presented a brief paper on *Defective Coquilles*.

He stated that for many years he had denied these to his patients, ordering instead plane smoked glasses. His attention had recently been called to the importance of the defects of these coquille smoked glasses by a patient with hypermetropic astigmatism, whose asthenopia had been greatly aggravated by a pair of smoked coquilles, which proved to be spherocylinders, combined with a prism of one degree up and out.

He then presented the results of the examination of a dozen pairs taken from the original package direct from the manufacturers.

The following are the results reported.

- (1) R. — .25° ⊙ Pr. 1 B. in.
L. — .37° ⊙ Pr. 1 B. in.
- (2) R. — .75° ⊙ — .50° axis 120 ⊙ Pr. 1 B. up.
L. — .50° ⊙ — .37° axis 135 ⊙ Pr. 75 B. up.
- (3) R. — .25 ⊙ — .25° axis 40.
L. — .37° — axis 110.
- (4) R. — .25 ⊙ — .25° axis 70 ⊙ 1 Pr. B. in.
L. — .25° ⊙ Pr. 1 B. in.
- (5) R. — .25 ⊙ — .25° 90 ⊙ Pr. 1½ B. out 1 Pr. B. up.
L. — .50° axis 180° 1° Pr. B. up.
- (6) R. — .37° ⊙ Pr. 1 B. out ⊙ Pr. 1 B. down.
L. — .25° ⊙ — .37° axis 125 ⊙ Pr. 1 B. 135.

- (7) R. — $.25^s \subset$ Pr. 12° B. out.
 L. — $.50^c$ axis $.90 \subset$ Pr. 1 B. 115.
- (8) R. — $.25 \subset$ — $.25^c$ axis $.90$. Badly scarred line through center, axis 75° .
 L. — $.25^s \subset$ — $.25^c$ axis $75 \subset$ Pr. 1 B. out.
- (9) R. — $.25^c$ axis $.30^\circ$. Badly lined surface.
 L. — $.50^c$ axis $.165 \subset$ Pr. $\frac{1}{2}^\circ$ B. out.
- (10) R. — $.37^s \subset$ Pr. 75 B. out.
 L. — $.37^s$ Pr. 75 B. in.
- (11) R. — $.37^s$
 L. — $.25^s$
- (12) R. — $.37^s \subset$ Pr. 75 B. in.
 L. — $.25^s \subset$ Pr. 1 B. up.

He contended that such defects must of necessity be more or less injurious to all weak and inflamed eyes, and that therefore the coquille glasses as found in the shops should be abandoned in practice, and be substituted by the plane smoked glasses. Even with these it was necessary to exercise care in ordering, to secure parallel surfaces, and thus avoid prismatic effects.

Discussion.—Dr. William F. Norris has been so often annoyed by the unpleasant effects of the irregular refraction of coquilles that he has discarded them and resorts to plane smoked glasses.

Dr. Ring has measured probably fifty coquilles and has found that without exception they are low minus cylinders.

HOWARD F. HANSELL,

Clerk of Section.

--THE-- OPHTHALMIC RECORD

A Monthly Review of the Progress of Ophthalmology.

VOL. VI.

CHICAGO, JANUARY 1897

NO. I. NEW SERIES.

EDITORIALS.

A FEW WORDS FROM THE OLD EDITOR.

"The RECORD has demonstrated its right to live": "I get more practical information from the RECORD than from any other current source"; "one single hint in one single issue of the RECORD has been worth more to me than the cost of several volumes": "I have followed the teaching of the RECORD with interest and can report many excellent results"; these are a few of the kind expressions that have been received from time to time, since the RECORD was founded more than five years ago. It was started in the interest of Ophthalmology and from the beginning of Vol. 1 to the end of Vol. 5 its only aim was the advancement of the science and art of Ophthalmology. The founder and former editor having been admonished a long time by friends that his three-fold work, practice, lecturing and editing, was too much for him; and his own judgment convincing him that his personal well-being and the interest of his family would be enhanced by lessening his labors, he decided soon after the end of Vol. 5 to transfer to another the work of editing and publishing the RECORD. He determined first that it would be to the best interest of the RECORD to allow its removal to a larger city, and chose Chicago as the place of all places for its permanent home. He did not know then on whose shoulders would fall the editorial mantle, nor in whose hands the matter of publication

would rest. He had faith that some strong mind would undertake the work of continuing the RECORD, and that strong hands would carry on the undertaking. In this he was not disappointed. The RECORD and its franchise have been transferred to Dr. Casey A. Wood who has already demonstrated his ability as an editor. The founder and former editor was rejoiced when he first learned that such a transfer was possible; and his joy knew no bounds when placing his signature to the paper that sealed the future of the RECORD for weal. If any should sorrow because of the retirement of the former editor, that sorrow will be more than counteracted by the gladness that, henceforth, Casey A. Wood is to be at the helm.

With his characteristic energy he has gone to his new work. This issue shows what he has done and gives promise of what he will do.

As will be seen the former editor remains editorially connected with the RECORD. He will be permitted to express his views on subjects he may discuss, in the same free and impartial way as has been his custom. The list of co-workers, as published, shows the diversity of talent that will be employed, all for the advancement of Ophthalmology.

The RECORD belongs to Ophthalmology; and every Ophthalmologist should enhance its financial prosperity by becoming a subscriber, and increase its literary success by contributing to its pages.

TO OUR READERS.

Although the members of the new RECORD staff recognize the difficulties that must always attend the editing of a journal of the size and character contemplated by them, they also believe they will have the support of the profession so long as that support is deserved.

The OPHTHALMIC RECORD is not and never will be published in the interest of a particular geographical section, of a professional clique or of any one aspect of ophthalmology. It hopes to have readers in and contributions from all parts of the world of science. Every reputable contributor, having anything worth publishing, will always be welcome to, and is hereby invited to use, its columns.

THE OPHTHALMIC RECORD.

TO THE MEMBERS OF THE MEDICAL PROFESSION.

Doubtless the readers of the RECORD have seen a copy of the communication from Dr. Gould (printed elsewhere in this issue of the Record) and I am sure every one of us is in accord with the contentions advanced by the writer and will feel, on reading his letter, an instinctive sympathy with him in the position he has taken. We know nothing of Messrs. Wm. Wood & Co's part in the controversy but their action certainly calls for an early explanation. That a contribution to the periodical literature of our art is the common property of the profession and should be freely accesible to every reputable disseminator of it, be he lecturer, writer, translator or abstractor is simply an axiom in medicine. I can hardly believe that Messrs. Wm. Wood & Co. will persist in this attitude towards a worthy publication like the *Year Book*; should they do so such action will not redound to their credit or serve to advance their interests among those who in the past have been its chief support.

C. A. W.

MISCELLANEOUS.

The next meeting of the Western Ophthalmological, Otological, Laryngological and Rhinological Association will take place in St. Louis, Mo., on the second Thursday and Friday of April, 1897. Those intending to read papers should send their subject to Dr. Hal Foster, Secretary, at once in order that the programs may be mailed February 1st, 1897.

The February number of the OPTHALMIC RECORD will contain (among others) an original paper by Dr. Edward Jackson, on The location of Opacities near the Posterior Pole of the Lens by means of the Corneal Reflex; one by Dr. Veasey, on Binasal Hemianopsia; one by Dr. Charles W. Kollock, on Epidemic Hemeralopia as seen on the coast country of South Carolina. There will also appear four reviews of the most recent contributions to Ophthalmology published here and abroad, book notices, editorials by prominent Ophthalmologists, society reports and miscellaneous items of interest.

The RECORD particularly desires short, practical papers on any subject connected with Ophthalmology. These will be published at as early a date as possible. It is understood that, unless otherwise arranged, original articles when accepted are contributed to the RECORD exclusively. Illustrative cuts will be made at the expense of the journal and proofs for correction will be sent to authors when desired. Reprints with covers are furnished at cost. One hundred of these will be presented to authors *gratis* when a request for them is written on the original manuscript. The RECORD will be issued monthly and each number will contain about 54 pages of reading matter.

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THE OPHTHALMIC RECORD

VOL. VI.

CHICAGO, FEBRUARY, 1897

NO. 2 NEW SERIES.

ORIGINAL ARTICLES.

"A SKIASCOPY DISK."

BY DR. S. MITCHELL.

Of Hornellsville, N. Y.

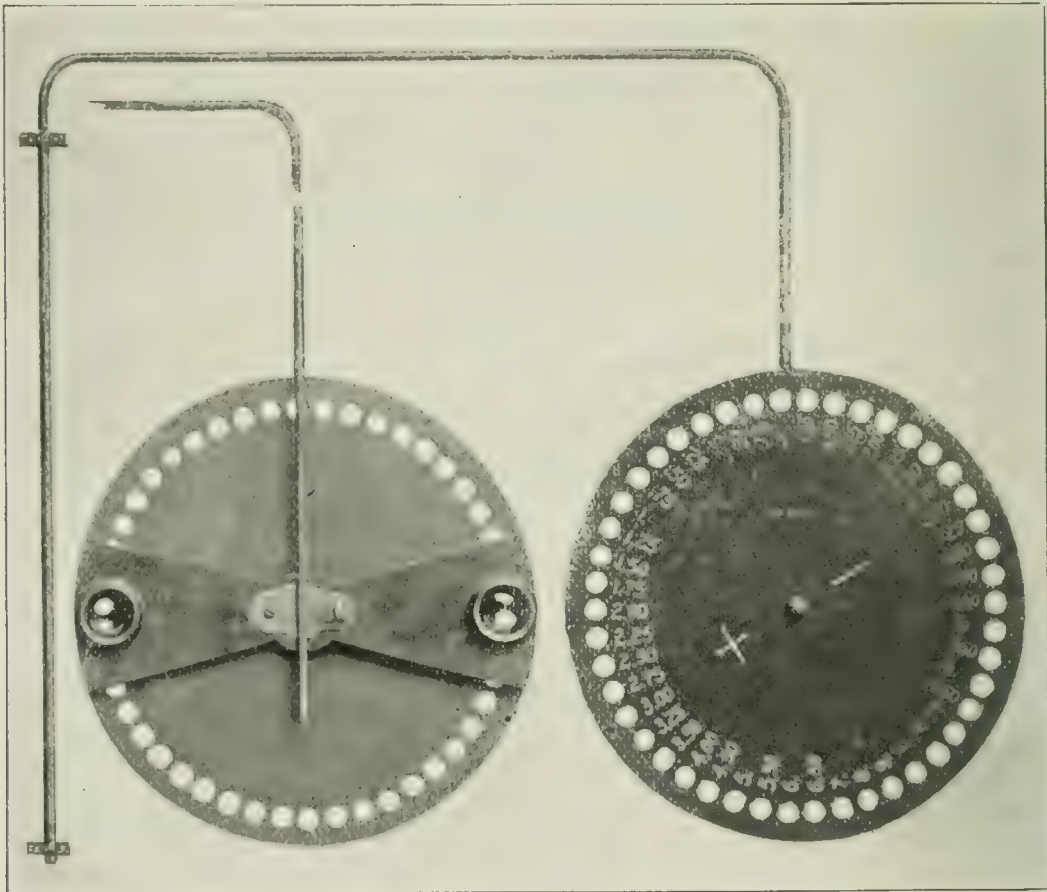
Oculist and Aurist to St. James Mercy Hospital. Oculist to the Erie Railroad.

ILLUSTRATED.

The accompanying illustrations are fair representations of a skiascopy disk that I have, in the past five years, come to regard as indispensable in the employment of this most valuable objective test for ametropia. I am fully aware that there is nothing new or novel in a disk of this sort. I first saw a description of one about five years ago in "*The American Journal of Ophthalmology*." I cannot now recall by whom it was written. It was from this article, and an illustration that accompanied it, that I received the idea, and took pattern for the construction of my disk.

The only excuse that I can offer for presenting a description of the disk, is to show how one of these useful adjuncts to the oculist's armamentarium, may be procured without any great expense. It is constructed entirely of wood, is 16 inches in diameter, and has 46 apertures near its outer border for the reception of lenses, that are three-fourths of an inch in diameter. This work was all done for me by the Frost Veneer Seating Company of 208 Canal street, New York. It cost, including expressage \$1.50. It is made by glueing two birchwood veneers to either side of a thin piece of whitewood. The grain of the wood is made to cross in such a manner that there

is absolutely no warping, although it is but $\frac{3}{8}$ of an inch thick. The immediate application of a wood filler, and painting the whole a dead black, was of course instrumental in preventing any warping. The lenses were made from discarded spectacle lenses, such as every oculist, who keeps a stock of lenses, is sure to accumulate on account of odd sizes, or from having the edges slightly nicked. These were ground to the proper size and shape by my optician, and by means of a little glue they were easily and securely fitted into the disk.



The lenses are of all foci, from 0.25 D to 9. D, that it is practical to employ in skiascopy. There are twenty-three of each, plus and minus. The numbering of the lenses, convex in white and concave in red, is done in figures of sufficient size to be easily read at ten feet. The disk turns on a $\frac{1}{8}$ -inch iron bolt, that passes through the hour glass-shaped piece at the back of the disk. This piece is of cherry, and is $\frac{3}{8}$ of an inch thick. Apertures, fitted with elevated eye pieces, are in either end of this piece, and correspond exactly to the lenses in the disk. In the center of the piece is a clamp, made of sheet-iron and worked with a thumbscrew. This holds the whole

apparatus upon the rod, or admits of any adjustment of the same. The rod is a $\frac{3}{8}$ -inch brass veneered curtain rod, six feet long and bent to form three sides of a square. One side is secured to the wall in the dark room, at a convenient distance from the floor, by means of a loop and socket. The opposite side holds the disk. Thus it can be swung into the room a distance of two feet, and brought before the right or left eye of the patient who is seated before an adjustable gas bracket. The turning of the disk is intrusted to the patient, and as the whole apparatus is so light and simple, it can be easily and satisfactorily manipulated by any person, endowed with sufficient intellect to manifest a desire for relief from eye strain.

In practicing skiascopy with the assistance of the disk, I consider any additional appliance, whereby cylinders can be employed in determining the amount of astigmatism, as superfluous and unnecessary.

While making an examination, the light is placed slightly above and back of the patient's head. Then I seat myself directly in front, and about four feet from my patient, who is directed to fix the eyes upon a small dot on the wall fifteen or twenty feet away, and slightly above the level of the eyes. I always use the concave mirror of the ophthalmoscope. The movement of the shadow in every meridian is carefully noted, as each successive spherical lens of increased strength, is brought before the eye, until the meridian of the least ametropia is reached.

This will be clearly indicated, by a reversing of the shadow movement in this meridian, even to the last quarter of a dioptré. The amount of ametropia in one principal meridian having been determined and recorded, it is a very simple matter to proceed with the test until the point of reversal is reached in the other; and the total amount of error is thus determined. If the case be one of simple astigmatism, the task of ascertaining and recording the same is accordingly simplified. My method of recording the findings of the skiascopy test, is by means of a large $+_1 \mathbf{T} +_2$ for each eye. This is drawn with the desired inclination in each case, to cause the lines to indicate the two principal meridians. These simple sketches, with the annexed $+$ or $-$ signs, and the figures to indicate the amount of error in each meridian, are invaluable assistants to have at one's command during the subjective test that follows.

THE LOCATION OF OPACITIES NEAR THE POSTERIOR POLE OF THE LENS BY MEANS OF THE CORNEAL REFLEX.

BY EDWARD JACKSON, A. M., M. D.

Professor of the Eye in the Philadelphia Polyclinic, Surgeon to Wills' Eye Hospital, Philadelphia.

ILLUSTRATED.

It is sometimes stated in works on ophthalmology that the apparent position and movement of an opacity in the dioptric media, as seen with the ophthalmoscope, depends on its relation to the center of rotation of the eyeball. That an opacity in front of the center appears to move downward when the cornea is rotated downward or the observer's eye is moved upward, while an opacity back of that center appears to move in the opposite direction.

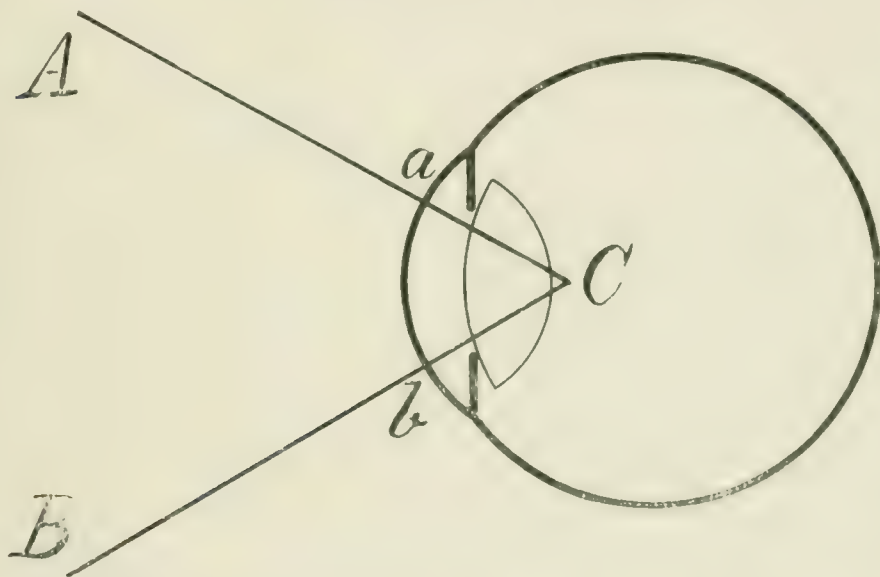
This statement is incorrect. It is true that a downward rotation of the cornea does carry with it an actual downward movement of all parts of the eyeball situated in front of the center of rotation, and an upward movement of all parts of the eyeball situated back of that center. But the actual relation of the various parts to the center of rotation of the eyeball is something that is not apparent—something of which the surgeon is never conscious—for the center of rotation is never seen as a point to which other objects can be referred.

The prominent landmark to which we do refer the apparent position and movement of isolated opacities in the dioptric media is the margin of the pupil. Those situated behind the plane of the pupil appear to move across it in the same direction as the observer moves his eye, or in the opposite direction to that in which the patient's cornea is turned. Those situated in front of the plane of the pupil appear to move in the direction the patient turns his cornea, or in the direction opposite to that in which the surgeon's eye is moved. An opacity lying in the plane of the pupil appears to keep a fixed relation to the pupillary margin whatever the direction in which the eye is moved, or whatever the direction from which the observer views it.

To judge of the distance of the opacity from the plane of the pupil we have to depend on the rapidity of its apparent movement across the pupil, or the extent of the excursion required to carry it entirely across the pupil. This paper, however, is written to call attention to another point to which opacities can be referred, with great accuracy when they are situated near the posterior pole of the lens or in the anterior vitreous, namely, the center of curvature of the cornea. To some ophthalmologists the method will not be new, for, as Dr. H.

Knapp informs me, it has been known "ever since Listing published his paper on Parallactic Movements of Opacities in the Eye, more than forty years ago." He has also mentioned it in a book review in the *Archives of Ophthalmology*, 1895, Part iv. p. 553. Still it has not been known to a large part of the profession; and has been quite ignored in recent ophthalmic literature.

When, with the ophthalmoscope, one looks into an eye the bright reflection of the lamp flame from the corneal surface occupies the portion of that surface perpendicular to his line of sight. That is, the reflection is seen in the direction of a normal or radius of the cornea. Now as all radii of the corneal surface pass through the center of curvature of that surface, the reflex is always seen in the direction of that center of curvature. Thus in the figure:



The surgeon looking into the eye from A will perceive the reflex at the portion of the cornea A in the direction of C the center of curvature. And on looking into the eye from B he will see the reflex at B again in the direction of C the center of curvature. As he moves from A to B the reflex seems to move across the pupil, its rate and extent of movement being exactly what would be the rate and extent of the movement of an opacity situated at the center of curvature of the cornea. Any opacity situated in front of this would appear to move across the pupil more slowly than the corneal reflex; and any opacity situated behind the center of curvature of the cornea would move across the pupil more rapidly than the reflex.

With the ophthalmoscope we can watch together the apparent movements of the corneal reflex and of opacities of the media situated

in the region, of the center of curvature of the cornea, can compare them and can detect slight inequalities of movement, and thus determine with great exactness whether the opacity is in front of or behind that center of curvature. With the ophthalmometer we may also measure with exactness the curvature of the cornea, that is the distance the center of curvature is behind the surface of the cornea.

The average radius of curvature of the cornea is about 7.8 mm. The distance of the posterior pole of the lens behind the summit of the cornea is usually given as 7.2 mm. With these dimensions the center of curvature of the cornea falls to 0.6 mm. behind the posterior pole of the lens. In particular cases of posterior polar cataract I have demonstrated that the posterior pole of the lens was as deep as the center of curvature for the cornea or even deeper.

It is well known however, that the cornea is in general markedly flattened at its periphery. The radius of curvature at 7.8 mm. is only for the central portion. Near the margin of the cornea the radius of curvature is longer, the center of curvature is farther back. Often in the part of the cornea available in this kind of an examination the difference between the curvatures at the center and the margin of the pupil is very noticeable. By taking careful measurements of portions of the cornea through which an opacity corresponds in direction with the corneal reflex, it becomes possible to fix its exact depth within the eye, when somewhat deeper than the center of curvature for the middle part of the cornea.

For exact accuracy with this test one caution is necessary. The corneal reflex is seen exactly in the direction of the center of curvature of the cornea only when light forming it is reflected to the eye from the region of the sight-hole of the mirror. If the light is reflected from some peripheral portion of the mirror the reflex departs slightly from the direction of this center of curvature; and departing in different directions when the reflex and the opacity are viewed from different directions might lead to slight error. In the use of the reflex to determine approximately the relation of an opacity to the center of curvature this possible inaccuracy can be readily guarded against, and at most it is of slight practical importance if the movement be watched from a distance of ten or twelve inches, or farther.

IMAGE-CHANGES CAUSED BY ASTIGMATISM AND BY CORRECTING CYLINDERS.

BY G. C. SAVAGE, M. D.

Of Nashville, Tennessee.

Professor of Ophthalmology in Med. Dept. Vanderbilt University.

(CONTINUED FROM JANUARY.)

Turning the right side of Fig. 3 up, the image-changes are shown when the meridian of greatest curvature is at 45° . It is clear that, if the astigmatism is equal and of the same kind in the two eyes, the meridians of greatest curvature being parallel though oblique, the two images of a square held vertically will be distorted alike, and hence will fuse readily and completely. If the meridian of greatest curvature in one eye is at 135° and in the other at 45° , the image in each eye will be a non-rectangular parallelogram leaning in the opposite direction from the image in the other eye and cannot be perfectly fused, though an attempt at fusion will be made, in an effort on the part of the eyes to obey the supreme law of binocular single vision, the law of corresponding retinal points.

When the meridian of greatest curvature is vertical in one eye and horizontal in the other, the fusion of the dissimilar images is attempted by the recti muscles: if the upper or lower borders are to be fused it is done by the superior and inferior recti; if the right or left borders the internal and external recti do the work; but the images, though of the same area, being differently shaped can never be perfectly fused by such a pair of uncorrected astigmatic eyes. Vertical astigmatism either against, or according to, the rule in both eyes involves only the ciliary muscles; vertical astigmatism according to the rule in one eye and against the rule in the other eye not only calls the ciliary muscle into activity but also calls the recti muscles into an abnormal or complicated action.* If with such eyes, vision having been fixed on the center of the square, the observer wishes to look at the upper border, the visual axis must be turned up by the two superior recti, the visual axes in the eye astigmatic according to the rule will have to move further than the one in the eye astigmatic against the rule, in order that the image of the upper border may fall on the horizontal meridian of each retina. Thus is interfered with the normal action of the superior and inferior recti muscles, which is to keep the visual axes in the same plane. The necessity for this complicated (as contrasted with the simple) function of the recti muscles may be seen by a further

*All forms of Anisometropia demand of the recti muscles the performance of their complicated function.

study of Fig. 1: Let $a-b-c-d$ be the figure seen by the right non-astigmatic eye, and $a'-b'-c'-d''$ be the same object as seen by the left eye astigmatic according to the rule. By no possibility can these figures be wholly fused, but different parts can be fused at will, but only as a result of the exercise of the complicated function of the recti muscles. If the vision has been fixed at the point of crossing of the diagonals, should an attempt be made to fuse the upper border of the object the visual axis of the right eye must be elevated only to the line $a-b$, while the visual axis of the left eye must continue to move until it reaches $a'-b'$. Fusion is thus effected by the one visual axis rising above the plane of the other. In the same way the complicated functions of the lateral recti muscles can be studied, there being no astigmatism in the right eye and astigmatism against the rule in the left. In the former case the vertically acting recti must continually perform the complicated function while the lateral recti perform only the simple function; in the latter case the vertically acting recti perform only the simple function while the lateral recti must continuously perform the complicated function. If in one eye the vertical astigmatism is according to the rule while in the other it is against the rule, then the recti muscles can perform their simple function only when the center of an object is looked at. In fusing any other parts, the complicated function must be performed. Only a correction of these cases of astigmatism by proper cylinders can give to the recti muscles the privilege of performing only their simple function. Astigmatism with the meridian of greatest curvature horizontal, in one eye, and no astigmatism in the other is worse than if both eyes were astigmatic with meridians of greatest curvature horizontal, for the reason that, in the latter, images in the two eyes being similar the recti muscles are called on to do only work that is normal; while in the former, images being dissimilar from side to side, the lateral recti muscles must do abnormal work (perform their complicated function). When there is no astigmatism in one eye and astigmatism with meridian of greatest curvature vertical in the other, the condition is worse than if both eyes were astigmatic with meridians of greatest curvature vertical, for the reason that in the latter, images being similar, the recti muscles must do only normal work; while in the former the vertically acting muscles must do abnormal work (perform their complicated function). The worst kind of vertical astigmatism exists when the meridian of greatest curvature is vertical in one eye and horizontal in the other, for then images are unlike both vertically and horizontally, and therefore require of all the

recti muscles the performance of the complicated function, except when vision is fixed on the center of the object looked at.

In binocular astigmatism, the meridians of greatest curvature being parallel, whether vertical or oblique, images must be similar. This being true the extra-ocular muscles have to perform only their simple function—do such work as they must do in emmetropic eyes. The correction of such cases of astigmatism is important that the ciliary muscle may be relieved from abnormal work. In all other kinds of astigmatism correcting cylinders are needed to relieve not only the ciliary muscle but also one or more pairs of the extrinsic ocular muscles.



I have proved in this and in former papers that there is distortion of retinal images in oblique astigmatism; and that the distortion is in opposite directions in the two eyes when the meridians of greatest curvature diverge or converge above. This much is already generally conceded even by my former critics. To state that such images can be wholly fused would not be correct; but that fusion is attempted by the harmonious symmetric action of the oblique muscles cannot be denied without, at the same time, denying the existence of the supreme law of binocular single vision, the law of corresponding retinal points. The most daring would hardly deny the latter. Figure 3 shows how a square would be seen as a non-rectangular parallelogram ($a'b'c'd'$) leaning down and in the direction of the meridian of greatest curvature, that meridian being at 135° , the eye being the right; turning the

right side of the cut up ($c'-d-a'-b$) shows how the left eye, the meridian of greatest curvature at 45° , would see the square.

The accompanying cut, Fig. 4, shows how these two images are fused by the action of the superior oblique muscles. This trapezoid is not seen as a whole by the two eyes; while $a'-b-c-d$ is seen in common by the two eyes, $a-b-a'$ is seen by the right eye alone and $d-c-d'$ is seen by the left eye alone. Invert the cut and the trapezoid shows how a square would be seen by a pair of astigmatic eyes whose meridians of greatest curvature converge above. In such eyes the parallelogram images of the square would lean down and towards the corresponding side; and the fusion of these images into the trapezoid would be effected by the harmonious symmetric action of the inferior oblique muscles. In either of these cases the effort put forth by the two eyes is such a to completely fuse horizontal lines, as is shown in the lower part of Fig. 4, or in part, as is shown in the upper part of the same figure, the unfused parts of the upper border being directly continuous with the fused. In fusing the horizontal lines, the vertical lines are made to lean more, hence the trapezoid. It is as impossible for these uncorrected eyes to fuse all the sides of the images as it is for me to explain why, in the attempt at fusion, preference is given to the horizontal lines.

These are my reasons for believing that there is harmonious symmetric action of the oblique muscles in astigmatic eyes whose meridians of greatest curvature either diverge or converge above:—

1st. In all cases in which the meridians of greatest curvature diverge above, a square figure is seen by the two eyes as a trapezoid longer side above. The lower the degree of astigmatism and the slighter the variance of these meridians from the vertical or the horizontal, the more nearly does the trapezoid figure approach the form of a square. While in these uncorrected eyes it may appear so nearly a square, that the patient will say that it is such, nevertheless it is not a square, as is shown by the fact that, after the correcting cylinders have been worn a proper length of time, these patients will always say that a square is a square when seen through the lenses, and that it is a more or less marked trapezoid when the lenses are raised, to become a square again as soon as the lenses are lowered. By all oblique astigmatics with meridians of greatest curvature converging above, a square figure is seen as a trapezoid with the longer side below, though at first they may fail to so observe. In the former class of cases a square is seen by either eye alone as a parallelogram leaning down and towards the opposite side, while in the latter class of cases each eye alone sees a square as a

parallelogram leaning down and towards the corresponding side. In my Edinburgh paper I showed how these images leaning in opposite directions were fused into a trapezoid by such a rotation of the eyes by oblique muscles as would bring the horizontal meridian of the retina of each eye into a position parallel with the upper and lower lines of the image.

2nd. Metamorphopsia through correcting cylinders approximately of the same strength, occurs only in those cases of astigmatism in which the meridians of greatest curvature diverge or converge above, and this metamorphopsia is always of a definite kind. In cases in which there is an equal quantity of astigmatism in the two eyes and the meridians of greatest curvature are parallel, whether vertical or oblique, the image-changes are precisely alike and therefore the images must fall on corresponding parts of the retinae. If the meridian of greatest curvature is at 135° in each eye, a square will throw a parallelogram image on each retina, leaning down and to the left. The two eyes together will see the square as a parallelogram leaning down to the left, precisely as each eye saw it. Fusion has been effected without abnormal action of either recti or oblique muscles, for the images had already fallen on corresponding retinal points. The proper cylinder placed before each eye at once changes the shape of the image from a parallelogram into a square, and the figure is seen as a square in both monocular and binocular vision. *There is no metamorphopsia following the correction of such astigmatics.* No muscle-habit has been formed in these cases and therefore no muscle-habit must be broken. In like manner it could be shown that the image-changes in vertical astigmatism are such that like images are formed in the two eyes. A square is converted into a rectangular parallelogram by the astigmatism and this figure is reconverted into a square by the correcting cylinders. Through these cylinders each eye sees the figure as a square and the two together see it is a square. *No metamorphopsia follows the proper correction of such eyes.* But metamorphopsia can be produced in these eyes by revolving the axes of the cylinders so that they may no longer coincide with the meridians of best curvature. Revolve both axes in the arc of distortion for the superior obliques and a rectangle becomes a trapezoid, longer side above; revolve the axes in the arc of distortion for the inferior obliques and the square becomes a trapezoid, longer side below. This metamorphopsia will never disappear until the cylinders are re-set properly; and the latter form of metamorphopsia is a source of less trouble to a patient than

the former, for the reason that the inferior obliques are better able to do the abnormal work than are the superior obliques.

Metamorphopsia always follows, for a longer or shorter period, the wearing of cylinders given for the correction of astigmatism whose meridians of greatest curvature diverge or converge above. The character of this metamorphopsia is always of a definite kind in any given case, and may be foretold. Its duration is variable, but sooner or later it always disappears if the cylinders have been properly adjusted primarily. In these cases the astigmatism converts the square into a parallelogram, and the cylinder re-converts the parallelogram into a square. Each eye alone, with the aid of the proper cylinder correctly placed, will see a square as a square, but the two eyes together will for a time see the square as an imperfect trapezoid. If the case is one whose meridians of greatest curvature diverge above, in binocular vision through the cylinders the square will be seen as a trapezoid the longer side below, a new condition the reverse of the old, hence readily noticed. If the case is one whose meridians of greatest curvature converge above, in binocular vision through the cylinders a square will appear as an imperfect trapezoid longer side above, a new condition the reverse of the old, and hence readily noticed. In either case the parallelogram images, leaning in opposite directions, have been transformed into squares exactly alike, and through these cylinders each eye alone sees a square as a square, because the axis of the cylinder accurately coincides with the meridian of best curvature. If this coincidence should not be destroyed, in binocular vision, then there could no more be metamorphopsia in these cases than is found in those cases whose meridians of greatest curvature are parallel. If it never occurs in the latter because there is no muscle-habit to be broken, its occurrence in the former must be due to the fact that there has been a muscle-habit and that it tends to persist. This habit has never been necessary in monocular vision, hence there is no disturbance of the relationship of cylinder axis and best meridian when a square is looked at with one eye, therefore it is seen as a square; in binocular vision the rotation of the eyes by the harmonious symmetric action of the obliques has always been a necessity, and the habit which has been formed by the obliques asserts itself, and when it does, there is a displacement of the best meridians, so that they no longer coincide with the cylinder axes, hence the metamorphopsia which is always observed by astigmatists of 1 D. or more. This displacement produces distortion of images the opposite to the old distortion by the astigmatism, that is, if the

images originally fused into a trapezoid with longer side above were non-rectangular parallelograms leaning down and towards the opposite side, the images now fused into an imperfect trapezoid longer side below, are non-rectangular parallelograms leaning down and towards the same side. In this case the displacement of the meridians has been effected by the superior obliques and the axes of the cylinders have been thus thrown into the arc of distortion for the inferior obliques. The moment the superior obliques lose their old habit, the meridians coincide with the axes of the cylinders and the metamorphopsia disappears. The same may be said of the inferior obliques, whose habit of abnormal action has been caused by astigmatism, whose meridians of greatest curvature converge above. In either case the metamorphopsia is new in kind, hence noticeable; but in all these cases it vanishes, usually disappearing sooner in those cases in which the meridians of greatest curvature diverge above. As soon as this new metamorphopsia disappears, the old kind can be easily brought out by raising the lenses while looking at a rectangle. It was harder to notice before, because the patient had always been accustomed to it. Now that a square has its correct shape with the lenses on, it at once appears as a trapezoid when they are raised

EPIDEMIC HEMERALOPIA AS SEEN ON THE COAST COUNTRY OF SOUTH CAROLINA.

BY CHARLES W. KOLLOCK, M. D.

Of Charleston, S. C.

For a number of years the writer has noted the prevalence of night-blindness among the negroes who live in what is called "the low country," near the coast, in South Carolina, and the rarity with which it occurs among those who live in the "up country," away from the coast. Even in the coast country it is seldom seen among the whites not a few of whom live with surroundings quite similar, if not identical, to those of the blacks. It is also interesting to note that it is nearly as rare among the mulattoes as the whites. Many explanations have been suggested as to the cause of night blindness, such as prolonged exposure to the rays of the sun and reflections from bright objects, impoverished condition from overwork, insufficient food and bad hygienic surroundings, exposure to miasmatic influences and some constitutional dyscrasias, as scrofula, syphilis, tuberculosis and the toxic effects of tobacco, alcohol, quinine, etc. It is easy to understand how sailors, longshoremen and others who are exposed to the rays of the sun for hours every day may have their retinae affected, and especially when it is remembered that this class of men do not usually have the best of food and are frequently addicted to the excessive use of tobacco and alcohol. It is also remarkable that among this class that the blacks are affected oftener than the whites, who, as a general thing, do not bear the heat as well as the former. Night-blindness is, however, not confined to those who are constantly exposed to the sun's rays and though no age seems to be exempt it is rarely seen among women. The explanation of this is rather difficult because they frequently lead exposed lives and though not as apt to use alcohol as the men are they are great smokers and tobacco amblyopia is not uncommon among them. The female child may be affected as often as the male. Malaria may be a cause and there is no doubt but that the negroes are especially exposed to this poison on account of the localities in which they live and the water they drink. In a number of cases examined no malarial history could be elicited and microscopic examinations of the blood failed to throw any light upon the cause. Night-blindness has been more frequently seen by the writer in negro children than adults. Some of these were apparently healthy and well-nourished, but the greater number were thin, scrofulous, syphilitic and at times tuberculous. There was often a

general enlargement of the glands throughout the system. The eyes present the most peculiar and disagreeable appearances, which have been previously described by the writer in papers on the eye of the negro. In nearly all cases both of adults and children the silvery scales are found upon the conjunctiva at the outer and inner margins of the cornea and extending toward the canthi. The presence of this satin-like formation undoubtedly indicates the existence of hemeralopia, though it may not be present in every case of night-blindness, and especially is this true among the whites. The xerotic condition of the conjunctiva is never absent in the negro and is therefore pathognomonic. These cases seem to have suddenly developed too much conjunctiva which resembles greasy yellow-stained parchment that is thrown into folds and wrinkles about the cornea with every movement of the ball. These folds and wrinkles are very noticeable during convergence when the plica semilunaris, sharing in the general laxity and not unlike the membrana nictitans of birds, extends in two long tangential folds above and below the cornea. In a broad band surrounding the cornea, but particularly at the outer and inner margins, the conjunctiva is deeply pigmented, the discoloration being greater at the corneal border and fading away toward the equator. The palpebral conjunctiva is never pigmented, but is usually swollen, velvety and at times distinctly granulated in appearance. In adults the cornea is less often affected than in children, in fact it is rare to see more than a soft, grayish elevation of the corneo-scleral junction of adults. The same condition is more commonly seen in children and sometimes the conjunctiva of the cornea is also loose, and is then thrown into folds by the pressure of the lids. This condition of the cornea is usually a forerunner of ulceration and necrosis. The ophthalmoscopic examinations have generally shown, with the exception of the cornea, clear media and a dirty-white and slightly swollen nerve head with haziness extending beyond its edges to the surrounding retina. The retinal vessels and fundus are generally but little changed. A thorough study of the vision for distance, field and color has not been made by the writer so that positive statements on these points must be reserved for a future paper, but in general it may be said, that where the cornea is clear and no serious error of refraction exists, the vision is fairly good during the day for distance, with a probable concentric contraction of the fields and some confusion as to colors. Children are especially blind at night. The treatment varies when the patient is an adult the use of tobacco, alcohol, quinine

etc., is stopped as a precautionary step; a general tonic course may be prescribed and constitutional weaknesses treated when they exist, but the remedy most to be relied upon is strychnia which should be administered in large and ascending doses. For children who are apparently in fair health a combined alterative and tonic treatment is advised, such as syrup of the iodide of iron, cod liver oil, and perhaps small doses of strychnine. Corneal ulceration requires the usual treatment with atropine, yellow ointment and in some instances with cauterisation. Eserine is useful at times when stimulation is required. Enlargement of the glands, emaciation and corneal ulceration are usually signs of approaching dissolution.

A CASE OF OPTIC NEURITIS, PROBABLY OF UTERINE ORIGIN.

BY JAMES L. MINOR, M. D.,
Of Memphis, Tenn.

Since Mooren of Düsseldorf called attention to disturbances of vision and uterine diseases, in the *Arch. fur Oph.*, Vol. XI., 1882, sporadic reports of cases with such connection have appeared, but the field is still undeveloped, and one may yet present individual cases and know that interest will be taken in them if the points are as saliently brought out as they are in that which I shall relate.

Mrs. W. Aet, 28, of Alabama, consulted me January 24, 1888, for practical blindness, and the following history was elicited: Health poor for a number of years, but nothing of definite character pointed to constitutional lesion of any kind. Never had headaches. Three months ago, when three months pregnant, had a miscarriage, and has suffered from menorrhagia since. Two weeks ago, vision began to fail, and has grown gradually worse until the present time, V. $\frac{2}{200}$ in each eye. Visual fields normal, with vision relatively much better in periphery than in center. Blind to all colors. Ophthalmoscope shows, well-marked optic neuritis in each eye, disks being slightly swollen about 1.50 D. For the neuritis, I suggested the use of those time-honored remedies, mercury and iodide of potash, dry cups to the temples and general building up of the health. An important step in the latter direction being relief from her uterine disorder. She was referred to Dr. R. B. Maury of this city, who found a lacerated cervix with everted lips, and retained organized placenta of a three months pregnancy. He first curetted, and that stopped the hemorrhage. Two weeks later the laceration was operated upon and soon after that the vision began to improve. I next saw and examined her about the middle of March 1888 and found V. $\frac{3}{20}$ in each eye. Visual fields normal; color perception normal. The optic neuritis had entirely disappeared. My recollection is, that the medicine suggested by me, was not taken during her sojourn in Dr. Maury's Sanitarium, and as she could see when she left it was not begun again, hence she got well without it, and because of her being relieved of her uterine difficulty, which had evidently caused her eye trouble. I heard of this patient, for four or five years after this, and know that she continued to enjoy good health and freedom from return of eye trouble.

ON ASTHENOPIA AS A FATIGUE NEUROSIS AND ITS ANALOGY TO THE PROFESSIONAL NEUROSES.

BY WILL WALTER, M. D.

Of Chicago.

We owe much to Dr. Weir Mitchell and to Dr. Thomson, who first pointed out eye strain as a cause of headache.

The careful study of refractive anomalies has so far relieved our patients of the accommodative strain that in the event of a recurrence of the symptoms or their occurrence in the absence of the former, we turn more and more to the extra ocular muscles for the cause.

Dr. Morris J. Lewis has aptly given the name copo-dys-cinesia — fatigueing, difficult or painful motion — to cover the affections known as occupation neuroses, professional neuroses, incorrectly named writer's cramp, telegrapher's cramp, etc., from the class of workers in which they occur rather than from the anatomical structures in morbid action. (We shall use the term dyscinesia as perhaps as expressive.)

That which has in past years been given most study is writer's cramp or Schrivener's palsy and will serve as the type in our brief review of the various factors of interest in dyscinesia, the analogy between which and so-called asthenopia it is our purpose to study.

Rather it is our desire to call attention to the analogy in order to determine whether the latter is indeed a form of the former; having ascertained that, to later study into the generating conditions of dyscinesia in all forms.

And while analogy may not be argument, an analogical reasoning may aside from its argument as such, aid in the solution of problems otherwise impenetrable by diverting a line from special to general thought or may by its argument turn investigations of an area more available for study to good account in the explanation of phenomena of a neuro-muscular mechanism the surroundings of which while necessary to their perfect action in health are still preventive to direct examination in disease.

We therefore ask justification for calling attention by review to many facts which will to most appear self-evident; and as some may not have recently gone over this subject in neurology, I will be rather full in my digest.

Writer's cramp is defined by Dana as a "chronic functional neurosis characterized by spasmodic, tremulous, inco-ordinate disturbances when the act of writing is attempted and associated with feelings of fatigue and pain."

Affecting clerks and professional men in the majority, ranging in years from 20 to 40, predisposed by inheritance or by a general tone lowered by sexual excesses, by disease or by poor hygienic environment, its chief exciting cause is ascribed to excessive writing, especially under mental strain and often in cramped positions.

Gradual in its onset the primary symptoms of stiffness, weariness and easy fatigue are merely noted as transitory effects of temporary indisposition; latterly one of several forms may develop or a compound of two or more in varying proportions, viz.: *Spastic*, according to Dana, Lewis and others the most frequent, in which the flexors, occasionally the extensors, are thrown into a state of contraction usually tonic, accompanied by inco-ordination for writing while the muscles may be used for other movements without much discomfort;

The *Neuralgic* or painful type, in which fatigue and pain are added to the spasm;

The *Paretic* form, according to Wood and other observers the most usual, wherein attempt to write is accompanied by great weakness and fatigue extending often to the whole arm or even to a general sense of excessive weakness; occasionally a banded sensation in the wrist is complained of; (Lewis states that "this form occasionally follows the spastic, or it is seen in those cases where the cause of the trouble has been a preceding neuritis, or it may be due to professional muscular atrophy as described by Onimus");*

The *Tremulous* form, accompanied by unsteadiness and tremor which may involve the whole arm in an intention tremor and which is looked upon by Dr. Lewis as a premonitory sign of professional muscular atrophy.

Vaso motor and *trophic* symptoms are described as common and are of importance. The former consist of active or passive congestion, accompanied by sensations of heat, formication, prickling, occasionally by hyperæsthesia and often a chilblain appearance, due to a local asphyxia.

Early in the painful type upon cessation of work the pain remits to recur on return to the work but if the acts be persisted in under the same conditions the pain becomes more or less constant often severe and extending upward to be felt even between the shoulders. Cases have been described as purely mental dyscinesia and many of the sufferers complain of insomnia and vertigo are mentally depressed and often emotional. Where the *individual* muscles have been

*It has been observed that a paretic condition of one muscle may coincide with a spastic condition of another not its opponent.

carefully studied constant electric changes have been found related to the symptoms presenting. Thus: "In those cases where spasm of one or more muscles is a more or less marked symptom examination shows, both to the faradic and galvanic currents a quantitative increase in the reaction, both in the nerves and muscles; when *paresis* is present there will be a quantitative decrease in the reaction. In the same arm some muscles may show a quantitative increase and others a quantitative decrease."—(Lewis.)

Pathologically the disease may be said to present no demonstrable lesion. This gives it a place among the functional neuroses and hence there early arose theories and the theorists became divided as to the central or peripheral origin.

Erb and Duchenne at the head of the great majority of workers held to the earlier view of the central origin and called it irritability of the nerve centres, Wood maintaining that the disease may be looked upon as a local neurasthenia; a few consider the later theory of the primary peripheral origin which by "abuse may become central, spinal," while "Roth considers that there are two entirely separate classes, the central and the peripheral, or local."

Facts of particular note are that if the affected arm be displaced by the other, like symptoms soon develop in the second, and that the power of the muscles remain little impaired for any coarser mechanism though immediately showing symptoms in the more finely co-ordinated movements; both arguments adduced in favor of the difficulty lying in the co-ordinating centers in brain or cord. Some have presented neuritis but are said not to be typical forms of dyscinesia.

In treatment rest is considered necessary; yet even after prolonged rest the symptoms have been known to recur in increased severity as soon as the use is resumed.

Gymnastics may be said to hold first place. Exercising the muscles daily for periods of twenty to forty minutes both without and with resistance, extending, flexing, adducting, abducting the fingers, carrying the work on rhythmically over the finger and thumb groups of muscles, the ingenious system formulated by the writing-master Wolff.

Daily massage upward, both kneading and percussion, with nerve effleurage likewise upward, and even to the cervical plexus, are added.

The faradic current is considered as possibly harmful in most cases. "The best application is the long continued use of a mild current

of galvanic electricity passed down the nerve of the affected member of just such strength as to be distinctly but not painfully perceived."-- (Wood.)

The conjoint movement of writing in which the work is little complicated and only the larger groups used, larger holders, coarser pens, the use of typewriters, all prophylactic measures are likewise recommended in the treatment. It is interesting to note in the history of the treatment that tenotomies of tendons were early instituted and some cures reported, though they were likewise early abandoned.

Lastly in the cerebral type the anti-neurasthenic treatment of rest in bed and forced feeding has been inaugurated with good effect. Strychnine, atropine, cannabis indica and alteratives constitute the medical therapeutics.

As to the neurologists prognosis, the concensus of opinion seems to be that it is essentially a chronic affliction and once established a distinct predisposition to the disease is present.

The gradual shortening of hours for bookkeepers and telegraphers and the almost complete substitution of the typewriter for copy work and correspondence, the improved hygienic surroundings of clerical workers have all contributed to reduce the prevalence of writer's cramp. Still neurologists state that dyscinesia is by no means uncommon, though writer's cramp furnishes a relatively small per cent compared to a few years ago.

Bearing in mind the fact that in the evolution of the higher functions of life the integrity of the fundamental plan is maintained though its lines are not always apparent, we are not surprised to find that the eye in its motions finds its homology in the lower muscle groups and is comparable to the motion brought about by any group of muscles over a ball joint; the sclera being the supporting framework of the eye serving for the attachment of muscles for motion as the femur for instance serves for the insertion of the muscles of the thigh operating in the acts to which it is adapted, the fixed point in the former being the orbital walls, in the latter the pelvic bones, the posterior outer wall gliding over a smooth and almost frictionless "union," practically analagous though far surpassing in the freedom of movement the mobile hip joint.

So also it has seemed to me that accommodation is in reality an act of prehension and as Poore has divided the act of writing into three acts, that of prehension, that of poising the hand and arm and that of moving the pen, so may we liken the first to accommodation,

the second to convergence and the third to associated movements in the act of reading.

We shall use the term asthenopia in its broadest interpretation, adynamic vision, covering both accommodative and muscular asthenopia, painful and not painful, though many observers interpret it to mean painful vision.

We find writer's cramp more common among men because they have been in past years in the majority in the causal occupations. The general belief is that asthenopia is more prevalent with women and this we expect from their habits of life.

And while presenting the same predisposing causes, a low general physical tone, inherited or acquired, the eye presents the further proneness to inco-ordinate action through demonstrable abnormal development.

This is the age of the development of the intellect through the medium of the special senses. For any point within 200 feet the activity of the ocular neuro-muscular mechanism is called into play. In housewives, whose work is so generally in the home circle, or among students, stenographers, typewriters, shop-girls and factory girls, there are few if any hours wherein this mechanism is suspended, its action ever varying within a few feet, more complicated and exacting as the work is nearer or finer, the eyes oscillating through various planes, even prolonged into late hours through manifold duties or social obligations or pleasures.

Among men as a class the demands upon the mechanism while not so exacting are in many present.

If upon this work is engrafted abnormal development as in heteropia or heterophoria, the mechanism is brought into play when the eyes are fixed even at the greatest distance and a load is added whose weight is greater as it is longer carried or further lifted.

From the symptomatology presented in asthenopia it is not difficult to formulate varieties for comparison, nearly identical to those presented in dyscinesia. As in one so in both the border line it is impossible to draw.

There are cases presenting, though not frequently, where asthenopia consists merely in a blurring of vision, at first transient, but later if the cause be not removed becoming constant; this may be called purely *spastic* asthenopia, and it may occur in patients presenting high abnormalities who are non-neurotic, though it may happen in low degrees upon a neurasthenic disposition and be the precursor of the

later developing neuralgic type. Generally however—and this is the usual acceptance of the term asthenopia—it is combined with the *neuralgic* as evidenced by the pains and reflexes so well known. Many of the disturbances of the muscular balance are relieved by refractive correction, but purely muscular asthenopia is unfortunately common. Indeed it is upon the etiology of this the conflict is to-day, the etiological source supplying the therapeutic measure; and we must come to understand that, once accommodative asthenopia of the neuralgic type has arisen a distinct disposition to muscular asthenopia of like forms persists and will certainly supervene if the same abuse and causal conditions continue. While a *tremulous* condition is present in some neurotic cases in my rather limited experience it is scarcely in sufficient prominence to form a distinct type.

The *paretic* type is instanced by the cases presenting wherein there is purely muscular debility and sensations of painful weakness.

The history of our somewhat empirical treatment of asthenopia of the muscular type is somewhat similar to that of the fatigue neuroses and we now find the field occupied by two broad classes which may almost be styled medical ophthalmologists and surgical ophthalmologists; and these are slowly drifting together and making a larger class of conservatives.

To prove such a disadvantageous variability in the balance of the arm muscles in the act of writing as it has been possible with the eye groups is however not easy, though it has been possible to prove approximately their comparative strength.

Nevertheless it is easy to see that in that position of writing, for instance, where the penholder drops below the first metacarpal bone, wherein what is termed in mechanics a toggle joint is formed, causing a drawing together of the first and second phalanges in a tighter grip (Lewis), or where the finger movement is used causing the tendons to operate over more acute and hence more frictional angles, or where cramp positions are assumed by incorrect relations of the lines of writing to the arm and slope of the letters, in all these greater neuromuscular energy is used and that they bear a closer relation to the additional strain upon the ocular mechanism above mentioned. It is also clear that while the former is easy to desist from when the particular work is over the latter is called into play through all the hours of waking.

With the usual references to improper use (and we have in mind both the incorrect methods of writing and ocular abnormalities) is to

be mentioned the fact that extra mental effort and special direction are necessary to muscular work done under such conditions and in this connection is to be added the use of the eyes for very fine work in dim or flickering light or reading in moving carriages or in a reclining posture.

We endeavor to recall to mind the analogy of functional activity as well as the homology of anatomical structure between lower muscle groups especially of the forearm and the neuro-muscular mechanism of the eyes; to establish the lines of similarity between the effects of excessive use upon the two mechanisms and the causes predisposing to these effects as analogous; to show that the treatment consists with both in removing the peripheral strain, the use of like medicinal remedies, of electricity and of gymnastics, probably at present the most important factor in the latter as well as the former. We are led to conclude that the corollary is a true one.

If it is granted, the fact that the great mass of authority in neurology is that dyscinesia is a disease of central origin, an irritability or a neurasthenia of the co-ordinating centers, is of particular interest to us here.

It would also seem that the results of electric stimulation which have served to show us variability in the reactions probably coincident with definite functional derangement in the study of dyscinesia, especially the opinion of Poore, "that increased irritability shows an early and decreased irritability a late stage of the same condition," should lead us to the greatest conservatism and exhaustive and prolonged study of individual cases before attempting alterations in tension of the less easily studied ocular muscles.

It also seems that we may with propriety, in lieu of a confessedly poor word, asthenopia, substitute *ocula-dyscinesia* (intra-ocular or extra-ocular as the case may be) and thus give it a place in nosology with dyspnoea, dysphagia, dysmennorrhœa, dysorexia, dysosmia and like terms; all of which serves it is true only for provisional diagnosis, though as such they will always be valuable.

If upon this subject neurologists and ophthalmologists occupy common ground, we may hope that by enlisting their work from this view point study into the primary causation of asthenopia will be productive of better results.

BINASAL HEMIANOPSIA, WITH THE REPORT OF AN ADDITIONAL CASE.

By CLARENCE A. VEASEY A.M., M.D.,

Adjunct Professor of Diseases of the Eye, Philadelphia Polyclinic; Chief Clinical Assistant to the Ophthalmological Department, Jefferson Medical College Hospital; Consulting Ophthalmologist, Philadelphia Lying-in Charity, etc,

Cases of binasal hemianopsia are of such infrequent occurrence that a report of the following may be of interest.

Mrs. L. L., widow, aged 54 years, consulted me concerning the condition of her eyes in April, 1896. She had first noticed that her vision began to fail five months before this time but the failure had been gradual and at no time had there been any severe headache or neuralgia. She recalled that seven months before I saw her she had a spell of nausea and vomiting that lasted about three weeks, the vomiting occurring always in the afternoon or early in the evening and never accompanied by any headache. During this period she sometimes vomited daily; sometimes every second or third day. There was occasionally a slight dull feeling in the temples, or over the brows, but this was never present in the morning. She had had her glasses frequently changed by an optician within a few months but was able to see with each pair for a short time only. Three weeks before consulting me, according to her statement, her eyes suddenly became very much worse as she had been able to do some sewing until this time. When she was first seen there was present the characteristic stare and facial expression of a partially blind person and she complained that there had been some numbness and heaviness in the left leg for two weeks, although an examination at this time failed to show anæsthesia of any portion of the body. There was also some tremor of the head and limbs and occasionally slight vertigo. No family history of syphilis or tumors of any kind could be elicited, and there was no perceptible impairment of memory, speech or hearing.

Examination showed both pupils equal in size, $6\frac{1}{2}$ millimetres in diameter and reacting to light when reflected directly upon them from the front, to convergence and accommodation though the response was exceedingly sluggish. The bulb was not congested and there were no external evidences of inflammation, although at times there had been attacks of photophobia. The vision of the right eye equalled light perception; that of the left eye equalled $\frac{1}{180}$ M. The tension was normal in each eye. An ophthalmoscopic examination revealed the following conditions:

O. D. The cornea was clear; the vitreous was filled with cholesterin crystals which moved swiftly about upon each movement of the eye-ball forming the condition known as *synchysis scintillans*. The disc was oval; its edges everywhere veiled. There was a large stellate-shaped arrangement of glistening white streaks and spots surrounding the macula, and a few smaller spots between the macula and the disc. The latter was decidedly pale as seen through the hazy media and there were two small flame-shaped hemorrhages on its surface, one on the upper and inner, the other on the lower and inner quadrant. The arteries were markedly diminished in size, some of them being mere threads, those on the nasal side of the disc being much smaller than those on the temporal side. There

* Read, by invitation, before the January, 1897, meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia.

were three small hemorrhages down and out from the disc along the course of the inferior temporal vein.

O. S. There were no cholesterol crystals in the vitreous but the latter was slightly hazy, the disc oval and very pale. In the macular region there was no such disturbance as existed in the other eye, though a few small buff colored spots were seen in various portions of the fundus. There was a small flame-shaped hemorrhage on the lower outer quadrant of the disc. The arteries were smaller than normal, though not so markedly as in the other eye, and those on the nasal side were also smaller than those on the temporal side.

An examination of the urine showed the total quantity passed in 24 hours to be two pints, the specific gravity 1018, the color pale amber, but no albumin, sugar or casts could be found though several specimens were examined.



Fig. 1.

The blood examination revealed no parasites but the amount of haemoglobin was only 58% of normal.

The fields of vision, as seen in Fig. 1, showed binasal hemianopsia. That of the right eye was taken with candles, the point of fixation being 4" to the temporal side and the macula being included in the blind half. The line of demarcation between the blind and the remaining portion of the field was distinctly vertical. That of the left eye was taken with a grayish-white object, 1 centimeter square, and the preserved portion of the field extended in the upper part, some on the nasal side. The macula was included in the preserved half. The color field for red, taken with an object 2 centimeters square, presented a somewhat different form, being fan shaped, including the macula, and here the blind part encroached slightly above and below, on the temporal side. No other color could be recognized. The preserved fields in each eye were concentrically contracted. There were no scotomata. Wernicke's hemianopic pupillary inaction was present and the knee jerk was diminished.

Dr. George E. de Schweinitz very kindly saw the case in consultation, and we decided the best treatment to be pursued was to administer mercury in the form of inunctions, to give rapidly increasing doses of potassium iodide and in addition small doses of nitro glycerin.

The patient remained under observation for one month at the expiration of which time the vision of the right eye equalled the counting of fingers at twelve inches excentrically, while that of the left eye equalled $\frac{2}{40}$ M. Despite the increase in the visual acuity the fields of vision were gradually becoming more and more contracted still preserving their hemianopic shape, as can be seen in Fig. 2. She insisted upon returning to her home in the South, notwithstanding the gravity of her case had been pointed out to her, where she died three weeks later. No autopsy was obtained, but her attending physician wrote me that she was going around in about the same condition as when I saw her until four days before her death. At this time she became extremely nauseated and there were frequent attacks of hard vomiting and severe muscular twitching in various parts of the body. Two days before death she entered a semi-comatose condition which became complete twenty hours before death and during which there were involuntary evacuations of the bowels.

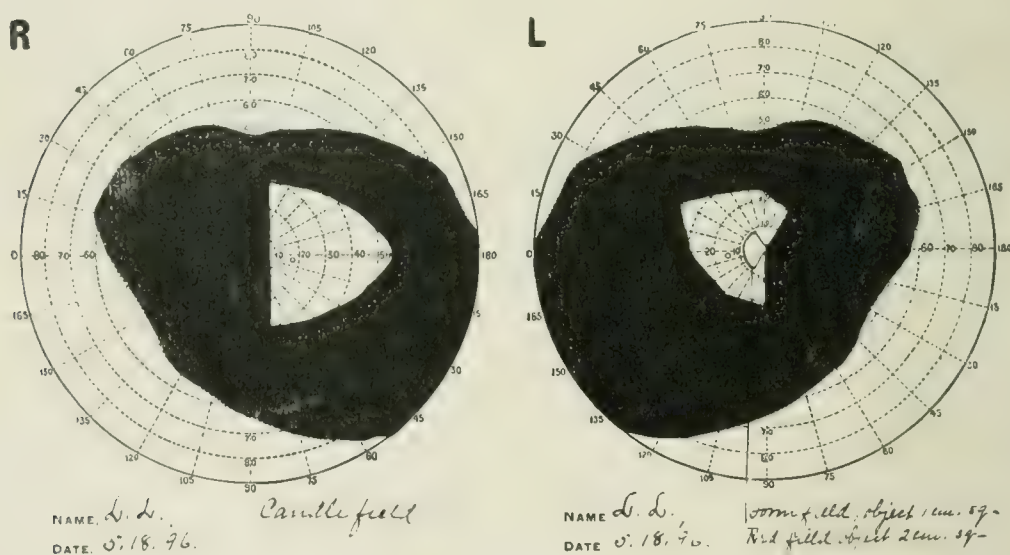


Fig. 2.

The literature of binasal hemianopsia has been partially gone over very recently by Fridenberg (1) who added a case to those already recorded.

His patient was a man who eighteen months before consulting him had struck his head in coming up the stairs from a cellar. The blow was severe enough to cause him to stagger but he did not lose consciousness. Six months later he noticed that he could only see "toward the outside." The patient was red-green blind. Ophthalmoscopic examination showed grayish-white discoloration of both discs, without noticeable excavation, and contracted vessels. His hemianopic condition did not improve.

In his paper the author reviews one case that had been reported by von Graefe², four by Mandelstamm,^{3 & 4} six by Daa,⁵ occurring in members of the same family, and two by Knapp,⁶ The other recorded cases are one by Schmidt and Wegner⁷, one

by Herschel, ⁸ one by Ole Bull, ⁹ one by Eskridge, ¹⁰ one by Lang and Beevor, ¹¹ and one by Eales, ¹².

The case recorded by Schmidt and Wegner was a female, aged 23 years. Slight edema of the ankles had existed for one year but prior to this the general health had been excellent. During this year there had developed headache, dizziness and vomiting and there was some disturbance of the visual acuity. The patient was anaemic. An examination of the urine showed the specific gravity to be 1009, the total quantity passed in 24 hours being 2600 c c., but there was no albumin. Some disturbance of menstruation also existed, this having been regular in all respects up to the beginning of the series of symptoms one year before. The pupils were widely dilated and the reactions sluggish. Ophthalmoscopic examination showed what was presumed to be the typical picture of albuminuric retinitis. The papillæ were swollen, the edges veiled, and there were numerous hemorrhages and whitish spots throughout the fundi. O. D. V. equalled the reading of Jaeger 17 at 5½ inches. O. S. V. equalled the reading of Jaeger 21 at 6 inches. There was binasal hemianopsia and excentric contraction of the remaining portion of each visual field. The case was thought to be one of albuminuric retinitis though no albumin was ever found in the urine at any time. There was no cardiac hypertrophy. The memory and intellect remained good but the vision gradually became less acute. There was an epileptiform attack lasting ten minutes a short time before death, the patient later becoming unconscious and attacked by excessive vomiting.

The autopsy revealed a tumor about the size of a pear situated in the middle of the left ventricle extending to the upper and external portion of the roof of the ventricle and lying loosely on the large ganglia. The optic thalamus was flattened and atrophied. The growth extended into the third ventricle involving the septum lucidum, the fornix and the external layers of the corpus callosum. In the right lateral ventricle from the middle part of the anterior horn down to the entrance of the posterior horn there was a tremulous cyst that very loosely pressed on the large basal ganglia of this side. The latter showed no change in shape, but the anterior corpora quadrigemina was markedly thinned and flattened. The aqueduct of Sylvius was so widely dilated that a large sound could be passed through it. The fourth ventricle was also dilated and the superficial blood vessels, as in the lateral ventricles, were larger than normal and contained blood.

The dura mater on both sides was somewhat oedematous. In the optic nerves there was some increase of fibrous tissue and some of the fibers were atrophied. The retinae were swollen and contained numerous irregular ecchymotic spots, none, however, being found in the macular regions. The tumor proved to be a telangiectatic gliosarcoma.

The case of Herschel was a female, aged 30 years, who a short time before had fallen and remained unconscious for awhile. Consciousness returned, however, so that she was able to understand when spoken to and the following day she attended to her housework. From this time on she suffered from periodical pains in the arms and legs which at times were so severe that she was obliged to go to bed. There was also some pain in the head. Sensation and co-ordination were normal. The visual fields showed binasal hemianopsia, the line of demarcation passing vertically through the macula. The pupils reacted promptly and

the ophthalmoscope revealed atrophic discoloration of both discs, especially on the outer halves. O. D. V. $\frac{3}{20}$; O. S. V. equalled $\frac{1}{20}$. There was red-green blindness in both eyes. The author assumes that the hemianopsia is due to the apoplectic attack, though not noticed for some time afterwards, the hemorrhage being much greater on the left side. As the patient was exceedingly dull intellectually it was thought that the condition existed immediately after the attack but remained unnoticed until later.

Henschen, ¹², records a case in which nasal hemianopsia existed in the right eye, the left being totally blind, where the pathological examination revealed a gummatous exudate surrounding the chiasm, and this to a certain extent is analogous to the case of von Graefe where there was found a gumma extending from the base of the brain into the optic foramina.

Bull's patient was 44 years of age and had been in good health until three years before. Since then had been having headache which increased in intensity. In addition there was great bodily weakness. There was present a congenital defect of the fingers of each hand and the patellar tendon reflexes were absent. The patient swayed when standing with eyes closed, but the gait was not ataxic. Ophthalmoscopic examination showed atrophy on both sides. O. D. V. equalled $\frac{1}{18}$; O. S. V. equalled $\frac{1}{18}$ (dull day). The green and red were recognised as gray, though red was properly recognised through a glass of this color. Injections of strychnia were employed for a time and the vision was somewhat improved, in O. D. equalling $\frac{1}{24}$; and in O. S. equalling $\frac{1}{24}$. This lasted for short time only and the patient became so weak that permanent confinement in bed was necessary, during which time the visual acuity gradually decreased and the visual fields became more and more contracted. Death ensued in a few weeks.

The autopsy revealed nothing abnormal macroscopically. Microscopically the tracts as well as the optic nerves were degenerated, and this degeneration had progressed to a greater degree in the former. In the optic nerves there were no fibers visible peripherally, but there was a bundle found 2 centimeters behind the eyeball, near the middle which was larger on the left side where it amounted to about half the diameter of the normal nerve; on the right being only $\frac{1}{3}$ or $\frac{1}{4}$ the normal size. At the same time the trabecular tissue had degenerated peripherally, especially on the temporal sides. In each tract there was found a small bundle of preserved nerve fibers, much smaller in circumference than the bundle in the nerves, and these were situated, not in the centre, but peripherally. The author thinks that these bundles correspond with the bundles in the nerves themselves and concludes from this that the macular bundle does not lie, as some observers claim, in the middle of the tract.

The same author states that he has observed two incomplete cases, both with disease of the spinal cord.

The case of Eskridge was a male Swede, aged twenty-three years, whose occupation was that of a track-walker. He had suffered from headache off and on for nine months, and for two months before the examination had very severe attacks, lasting for more than a week at a time, preventing sleep, and occasionally being accompanied by a vomiting spell that occurred usually in the morning. It was understood that a short time before he had been unable to walk or stand without assistance but after taking large doses of potassium iodide and mercuric bichloride he had been greatly improved.

The vision of O. D. equalled faint object perception on the temporal side, the nasal side being blind. The pupil was widely dilated and the ophthalmoscope showed marked papillitis, with narrowing of the arteries, distended veins and abundant exudate which completely covered most of the vessels as they passed over the disc. The swelling was about 7 dioptries. Vision O. S. equalled faint light perception on the temporal side, the nasal side being blind. The pupil was about the same size, or a little larger than the right. Ophthalmoscopic examination showed marked papillitis and beginning atrophy, with arteries very small and veins less distended than in the right eye, and considerable exudate, the swelling being equivalent to 6 dioptries. Wernicke's hemianopic pupillary inaction was present.

The patient continued rational most of the time preceding his death which occurred about six months after the examination was made. For a few weeks before this occurred there had been noticed dysphagia, weakness of the entire body, almost continuous bleeding from the gums, congestion of the left eye, and marked retraction of the head. He first lost control of the sphincters of the bladder and rectum during the night, but for two months before death the loss of control existed during the day as well.

The autopsy showed a tumor in the left lobe of the cerebellum, which had extended forward and toward the median line, and evidently before death had exerted pressure upon the pons and medulla. The pia surrounding the optic chiasm was greatly thickened, and had pressed upon the optic nerve and chiasm. The tumor was encapsulated, and proved to be a gliosarcoma."

Lang and Beevor's case was a female, aged 33 years. The vision had been failing for two years and she had been unable to read for eight months. For several weeks there had been rheumatic pains in the legs.

The patient could not walk toe and heel along a straight line. No incoordination in the hands. The sphincters were not affected and the knee jerk was absent. The pupils would not react to light but did react to accommodation. Movements of the eyeball were normal; O. D. V. equalled $\frac{6}{24}$; O. S. V. equalled $\frac{5}{60}$. There was optic atrophy of both discs, binasal hemianopsia and the patient was red-green blind.

The vision gradually became worse.

The case recorded by Eales more resembles my own case than any of the others.

A male, aged seventy-five years, had been having gradual failure of vision for eighteen months following a long period of ill-health. There had also been failure of hearing for two years. There was no history of syphilis, and there had been no headache or vomiting. The vision of O. D. equalled $\frac{5}{60}$; that of O. S. equalled $\frac{1}{2}$, with + S. 1 D. Both discs were filled in and presented a grayish yellow appearance. There was loss of definition of the margins as if an interstitial neuritis of a chronic, not very severe type had been going on for some time. There was no swelling, the retinal vessels were practically normal, and around each disc there was an irregular ring of choroidal atrophy confined to the superficial layers. The optic nerves showed no evident signs of atrophy. A mitral systolic murmur and a chronic cystitis were found to exist. An examination of the ears revealed disease of the labyrinth. The visual fields showed binasal hemianopsia a large portion of the upper part of the temporal half being included

in the blind half. Wernicke's hemianopic pupillary inaction was present in both eyes. The patient received treatment for two months, during which time the visual acuity improved somewhat and the visual fields gradually grew smaller. There was some concentric contraction of the temporal fields from the beginning but this steadily increased.

In commenting upon this case Gowers says "The case suggests to me a bilateral inflammation of the trunks of the optic nerves in front of the chiasma, extending to this, and chiefly intense symmetrically at each side of the chiasma. The symmetry of interstitial inflammation in the nerves and nerve-centres is remarkable. I think that nasal hemianopsia has never been due to disease behind the chiasma, and I cannot conceive that it could be thus produced. That the disease is there is strongly supported by the extension of the loss across the middle line above, while the fact that this extension is greater on one side is what we should expect since inflammation, although symmetrical, is seldom exactly so.

The progressive diminution in the field is what would be expected from cicatricial contraction of the new tissues—it is quite unlike the effects of a growing tumor."

These remarks from so eminent a neurologist, seem to me to apply equally well to my own case so that further extended comment is unnecessary.

It is interesting to note, however, that in my case the macular region in the right eye was included in the blind portion of the field, while in the left eye it was included in the preserved portion, a circumstance which it seems to me would indicate that on the right side the inflammation had extended sufficiently far to involve the macular fasciculus while on the left, the latter had not yet become attacked, a view further supported by the fact that in the right eye the line of demarcation between the preserved and blind portions of the field was a vertical line while in the left eye this was not the case, a small portion of the preserved field extending beyond the median line into the nasal portion thus showing that a few of the fibers supplying the temporal side of the left retina were yet uninvolved.

BIBLIOGRAPHY.

1. P. Fridenberg. A Case of Binasal Hemianopsia Following Cranial Traumatism, New York Eye and Ear Infirmary Reports, January, 1896, Vol. IV., Pt. 1. (One case.)
2. A. von Graefes, Ueber die Untersuchung des Gesichtsfeldes bei amblyopischen Affectionen. Archivs f. Ophthalmol, II. 2 p 387. (One case.)
3. E. Mandelstamm. Klin. Beobacht. 1866, Vol. III. p. 70, (Two cases.)

4. E. Mandelstamm. Ueber Sehnervenkreuzung und Hemiopie. *Archiv f. Ophthalmol*, XIX, 2, p. 39. (Two cases.)

5. A. Daa. Hemiopi Det 6 Tilfaelde i samme Slaegt (Case of hemianopsia the sixth in the same family.) *Norsk. Magazin f. Lægevidenskab*, Bd. 23., p. 615. (Six cases.)

6. H. Knapp. Hemipic and sector-like defects in the field of vision and their connection with diseases of the heart and brain. *Brown-Sequard's Archives of Scientific and Practical Medicine*, p. 293-310. New York, 1873. (Two cases.)

7. Schmidt u Wegner: Aehnlichkeit der Neuro retinitis bei Hirntumor und Morbus Brightii. *Archiv f. Ophthalmol*. XV., 3. (One case.)

8. Herschel. Hemianopsia Nasalis. *Deutsche med. Wochenschr.* 1883. (One case.)

9. Ole Bull. Perimetrie, 1895, p. 191. (One case.)

10. J. T. Eskridge; Tumor of the Brain with Double Nasal Hemianopsia. *International Clinics*, Vol I., Sixth series, p. 176. (One case.)

11. Lang and Beevor. Binasal Hemianopsia in a case of Tabes Dorsalis. *Trans Ophthal Soc., Unit King.* 1894, p. 246.

12. Eales. A Case of Binasal Hemianopsia. *The Ophthalmic Review*, Vol. XIV., July, 1895, p. 203. (One case.)

13. Henschen. Klinische und anatomische Beiträge zur Pathologie des Gehirns, Upsula, 1890-1895.

CORRESPONDENCE.

A CLINIC BY PROF. FUCHS OF VIENNA.

Reported for the Ophthalmic Record.

BY L. D. BROSE, M. D., PH. D.

Of Evansville, Ind.

Case I.—A woman, 22 years of age, who for the past three years has suffered from palpitation of the heart, is easily excited and frequently absent-minded. During the day the eyes water (epiphora) and a catarrhal condition is easily set up. On inspection it is noticed that the eyes are unusually prominent and staring. The upper lid is higher and more retracted than normal and does not follow the eyeball on looking down. In addition there is found to be a marked enlargement of the thyroid gland. She has been treated before in this clinic with electricity and medicine taken internally and, at the same time, one eye being more prominent than its fellow, a tarsorrhaphy was done to enable her the more readily to close the lids over the exposed cornea.

This patient's disease is termed "*Morbus Basedow*," and is as a rule slow in its development. Women suffer from it more often than men. Generally the patients first complain of being easily excited and upon slight provocation they suffer from palpitation of the heart. They gradually become emaciated and the neck enlarges, a bronchocele develops. The eyeballs gradually become more prominent, so that during sleep the lids do not wholly cover the cornea. The exophthalmos is nearly always occasioned by an overfilling of the blood vessels in the fatty connective tissue at the back of the orbit. The eyeballs themselves are not enlarged, but there is a venous stasis in the orbital connective tissue causing it to become turgid. After death as a rule the eyeballs recede. Still, true hypertrophy of the retrobulbar tissue may occur, and in such cases the exophthalmos remains after death. We can measure whether the eyes are unduly prominent or not by allowing a ruler to rest upon the lower and upper orbital edge, it will not come in contact with the cornea if the eyeballs occupy their natural position.

On account of the insufficient lid protection during sleep the corneal epithelium desiccates is exfoliated and ulceration and inflammation ensue. The lower part of the cornea suffers most, because during sleep the eyes are rolled upward under the upper lid leaving that part of the cornea exposed to the atmosphere. This upward rotation of the eyeball during sleep may be seen in a sleeping child by gently raising the upper lids, also in some thin skinned people the eyeballs may be seen under the closed lids.

Our patient has two small superficial abrasions of the left eye just above the upper pupillary border.

In Basedow's disease there is a loss of the natural involuntary blinking eye movement and the act becomes purely a conscious voluntary one and is far less frequently performed than usual, as a result, the cornea is liable to injury from dust, foreign bodies, as well as from wind and drying from the atmosphere. This condition is known as Keratitis post-lagophthalmos and saturated opacities in the lower part of the cornea are frequently indicative of a severe past illness, such as typhoid fever. The old name of Keratitis neuro-paralytica is incorrect, since in paralysis of the nerves if you artificially close the eye and prevent desiccating and injury from taking place no disease of the cornea follows.

Von Graefe was the first to point out that the upper lid does not follow and move down so quickly as the eyeball and even while moving downward in the act of downward vision, it will frequently be spasmodically raised, exposing a wide white scleral margin. This is due to the muscle of Müller being constantly in a state of tonic contraction and which from its attachment to the tendon of the levator palpebrae and the retro-tarsal sulcus strives to retract the upper lid. The exophthalmos occurs slowly, as a rule, but may result, after fright, in one night. It may be limited to one eye, when there may be some difficulty in making a diagnosis. Since the greatest danger to the eye is from corneal exposure, at night upon retiring we instruct the patient to apply a bandage. However, where the disease is very chronic and of high degree it is best to resort to tarsorrhaphy. In applying a compress and bandage for the night great care must be taken that the lower lid is approximated to the eyeball so that it will be impossible for the cotton to come in contact with corneal surface. The treatment of the local eye condition in our patient will be a bandage at night and atropine instillation.

Case II.—Is a patient with great swelling of the left eyelids and with some protrusion of the eyeball. The man is a school teacher, 34 years old and says that the trouble began twelve days ago with aching pain in the upper orbit. There is great swelling and edema of the lids so that the patient cannot voluntarily open them. Underneath the swollen lid the conjunctiva is congested and highly chemotic, the eye movements are restricted, but the eye itself remains healthy. On deep digital examination between the upper part of the globe and the orbital wall, we find a sensitive more resisting spot due to a periostitis. The cause of the disease, however, is obscure, the man denying all evidence of syphilis, nor can we get a history of tuberculosis. Likewise does he fail to recall an injury at this spot. Warm applications were ordered and iodide of potash administered. Three days later pus was spontaneously evacuated from under the upper lid, and on introducing a probe roughened bone was found, thus corroborating the diagnosis of orbital periostitis.

REVIEWS.

Congenital Opacities of the Cornea.—By P. N. Barbacheff, Professor of Ophthalmology at Kharkow, Russia, *La Clinique Ophthalmologique*, October, 1896. The comparatively few observations made concerning this condition, and the exception of the nature of the case which Prof. Barabacheff reports, add to its interest and make it worthy of a careful study.

The patient, a new born child, weighing about eight pounds eighteen inches long, whose general appearance was that of a premature or ill nourished child, having the skin of the hands, face and feet very much wrinkled and icteroid. It exhibited on examination the following points of interest: *Lids* much swollen, cyanotic and turgescient; on separating the upper from the lower an abundant cloudy secretion ran out. The superior tarsal conjunctiva was covered by a yellowish membrane which was readily removed in part. The conjunctiva lining the cul-de-sacs was swollen and red. The bulbar conjunctiva oedematous, presenting a true picture of chemosis. The corneae were lustreless and seemed covered with small punctures. On each were distinctly seen grayish spots which assumed in the R. E. the shape of an oval five mm. long, reaching as far as the pupil; while in the L. E. its shape was that of a rounded segment four mm. at its base, not quite reaching the inf border of the pupil. The epithelium was intact and the curvature of the cornea showed no abnormality.

It seemed, the author says, that I undoubtedly had before me a severe case of purulent ophthalmia, but the corneal opacities could not be directly connected with it.

The mother, it is true, was suffering from leucorrhoea. The child had been born two and one-half weeks before term, and probably on account of an early rupture of the sac the labor had been a tedious one. Two hours after birth the midwife had noticed the suspicious suppuration and had instilled a solution of AgNO_3 (Credé's method).

It might be supposed at first that the corneal nebulæ and the inflammatory reaction had been produced by the careless instillation of the silver solution on an abraided cornea, or that the solution could have been harmful to the cornea of a premature child suffering from icterus. At any rate the grave blenorrhoea was a serious and dangerous complication.

The cul-de-sacs were carefully washed with formaline (Merck) 1-2000, atropine was used and frequent lavage as well as constant ice compresses were prescribed. Under the treatment the eyes improved greatly, and after the third day a 1% sol. of AgNO_3 was instilled, followed later by a 5%, then a 3% until the eighth day, when all sup-

puration disappeared. The corneae became clear and brilliant even over the gray opacities, which meanwhile grew rather worse. On inspection with the lens they were localized in the deeper layers, and by oblique light only, they seemed made up of groups of dots and striae. The anterior chambers and irides were normal.

Irrigation with formaline 1-2000 and boric acid 4% were continued. The opaque places remained the same until the twelfth day, when, by means of the lens, blood vessels were seen coming from the sclera, under the limbus, going deeply into the opacities, which in a few days became red. In less than three weeks only a small stria remained in the R. E. and a small dot in the L. E. Insufflations of calomel were prescribed, and now, three months later, the condition is much improved, and the corneae bid fair to exhibit yet greater transparency.

Family History.—Mr. and Mrs. M., father and mother, are both free from syphilis, but both showed strong scrofulous tendency when young. On the mother's side the father contracted syphilis before marrying. One year before her birth the father complained of violent headaches and soon had an attack of paraplegia followed by loss of memory and disorder of speech. Three months after Mrs. M.'s birth her father had new paralytic attacks and soon died age 35. Mrs. M.'s mother was well and strong; she, however, died three years after her husband, having had two children, a son (born prematurely) who died when two weeks old, and a daughter, Mrs. M.

Mrs. M. had been married 19 years, and was suffering from a chronic inflammation of the vagina, which treatment ameliorated and resulted in pregnancy for the first time.

Having excluded all artificial irritation from without, and considering the character of the disease, its location, and finally its ultimate course, the diagnosis of congenital opacities seems to be the only correct one to make.

Thanks to the researches of Ammon, Steffan, Kruse and others, the origin of congenital spots in the cornea is no longer an enigma. Embryology has enlightened us on many obscure intra-uterine changes.

Kalliker demonstrated that the cornea forms a part of the sclera of the mesoderm, and that it is only at the end of the third month or at the beginning of the fourth that the latter clears up. The possibility of its being opaque because of retardation or cessation in the process becomes at once evident.

Some observers explain thus the origin of a number of congenital opacities. Steffan accounts for these in two ways: (1) Arrest of development (*Hemmungsbildungen*), and (2), anomalies occurring during the development of corneal tissues (*Bildungsanomalien*).

The majority of congenital spots in the corneæ are classified under these two categories, but a third cannot be ignored, i. e., those caused by inflammatory processes in utero. The existence of this third group is verified by the observations of Panas, Zender, Tieplachine and others. De Wecker divides congenital inflammatory opacities into three classes:

1. Opacities caused by glaucomatous process.
2. Congenital adherent leucomata.
3. Sclerotic opacities.

To which of the two groups does our individual case belong? To the inflammatory or non-inflammatory?

The slightly premature birth cannot be considered as causative. Kruse's researches demonstrate that before the seventh month of embryonic life the cornea has attained full development, being only a little thinner than at birth. It might be proposed that we have for consideration an arrest of development, i. e., an imperfect transformation of fusiform cells into fibrillæ. But the history of the case, the sudden vascular change in the deep layers and the ultimate cause of the trouble refute the plea for arrest of development and non-inflammatory origin. We therefore classify it in the inflammatory group and in De Wecker's third class, i. e., parenchymatous keratitis.

As for the etiology of the disease we add the following: An interstitial keratitis is often found in subjects whose parents are free from syphilis. In such cases we look for the cause in scrofula, tuberculosis, debility, etc.

In this particular case the child could have inherited a scrofulous tendency from his parents, and the defective nutrition had some influence upon the state of the corneæ at birth.

The grand-father's history and death seem to point to specific trouble, and therefore to a more rational cause of the corneal disease.

Mrs. M. suffering from scrofula only could have transmitted the syphilitic dyscrasia to her son, and for this reason we have a right to consider his keratitis a syphilitic affection in the second generation.

H. A. BEAUDOUX.

Erythropsia—by Professor Ernst Fuchs, of Vienna. *Graefe's Archivs*, Vol. 42, No. 4. Oct. 1896.

This is an exhaustive article well worthy of perusal, giving in detail Dr. Fuchs' elaborate researches and deductions in regard to the interesting subject of Erythropsia.

One feels obliged, considering the masterly handling of the subject, to review it rather fully.

In a short historical reference it is pointed out that Becker so far back as 1877 mentions the occurrence of Erythropsia after extraction in 3% to 5% of all cases of cataract.

The majority of cases reported since have been mainly those in which the lens was absent or the pupil dilated.

The external conditions favoring its appearance are dazzling or overheating.

The above variety of Erythropsia constitute the theme of Fuchs' article.

There are other atypical forms namely; that of the epileptic aura, in which the red vision assumes definite forms, such as flames, figures, etc.: then again the red vision arising from intraocular hemorrhage; also a very interesting variety which appears when one has a bright light close to the side of one eye, the other eye being shaded, here dark objects appear red to the illuminated eye, and light objects red, to the shaded eye.

A very interesting example of this found in history, is the occasion on which Henry IV of France was playing chess with the Duc d'Alencon on the eve of St. Bartholomew's massacre—the chessmen appearing red.

Other atypical forms occur during the course of severe fevers, after a saber wound in the vicinity of the eye, in optic atrophy, in Migraine, in Hyperopia, etc., it is very doubtful if these are of central or peripheral origin.

The typical erythropsia is caused by retinal dazzling, more light than usual reaching the retina, or else the retina reacts abnormally to ordinary light stimulus.

Fuchs here mentions several typical cases after observing a sun eclipse, a lightning flash and bright reflection of light from the surface of sea.

Dazzling due to sunlight reflected from snow almost invariably causes Erythropsia, especially at considerable heights above the sea, and the Erythropsia is more marked if the illumination is suddenly diminished as when one enters a house.

Fuchs first observed Erythropsia in his own experience in 1894 after trudging through the snow to the top of a hill 2278 metres high. The snow was freshly fallen and the day being cloudy he wore no protection glasses—the walk extended over four hours.

On entering a hut, he observed after a few seconds that every object appeared a rosy purple, except some very dark ones which were yellowish green in color. The Erythropsia disappeared in a few minutes. The next day his skin was very red and swollen, finally peeling off.

These symptoms Fuchs found were due to the preponderance of violet and extra violet rays in the light—the overclouded day and the height above the sea favoring their development—in addition the snow reflects these short waves of light more than the long ones.

Very few cases of Erythropsia in normal eyes have been reported, which Fuchs considers is due to the great height necessary for its development, and to the necessity of withdrawing into a darkened place to observe them.

Erythropsia is not noted in Arctic regions where snow blindness is so common as there are no great elevations.

In abnormal eyes, Erythropsia is far from uncommon, e. g. aphakic eyes or eyes with dilated pupils or colobomata, being due to the unusual amount of light reaching the retina.

Sometimes it is seen in cases of opacity of the media, and is due to some much diffused light reaching the retina.

Abnormal reaction of the retina to light is also a cause of Erythropsia for example, the congestion occurring after eating, in anger, overheating, dancing, laughing, coughing, suppression of the menses, etc. These however do not alone cause Erythropsia, but simply predispose when other conditions favor, e. g. the dilated pupil of anger.

Disturbance of general nutrition favors it as in Hemeralopia with pregnancy or lactation; both Hemeralopia and Erythropsia may be here present together or at different periods, and are likely due to faulty reproduction of the visual purple in the weakened retina.

There are certain definite rules followed by Erythropsia :

1st. It appears when one passes from the bright light into a darker place, e. g., a house or it may be seen only at dusk, when the candle is lit, the flame appearing red.

2nd. Often noticed on first awaking in the morning and rapidly disappears.

3rd. Once Erythropsia has appeared, it is prone to recur day after day without additional exposure to bright light—one attack thus predisposes.

This red vision shows itself especially on observing clear objects, e. g., flame, tablecloth, etc.

The true color of an object is perceived through this red shimmer, except green, which, if not saturated, appears gray—a black coat appears either, or if shiny, slightly red—if an object is of a dense saturated black color it appears greenish.

The reddish color of Erythropsia is of a purple shade.

Erythropsia may occur only in one eye (aphakic), or only in one part of the field, e. g., the lower part from the upper portion of the retina being most stimulated by snow surface below it.

Erythropsia is a perpetual phenomenon.

Fuchs then details his experiments very fully and as a result states that Erythropsia is a physiological, not a pathological phenomenon.

In pathological states, this physiological phenomenon can be more marked and last longer.

Fuchs found that he could get the same Erythropsia without ascending mountains, by simply dilating the pupil and making the experiments on the lowlands.

A chess board was used to study the phases of Erythropsia.

After gazing on the snow for some time just short of being intensely dazzled, if one goes indoors and looks at a chess board, after the retina has had time to adapt itself, the black squares of the board appear green. The green gradually becomes more intense, and soon the white assume a yellowish green tint.

If the illumination be suddenly increased the green fades only to reappear more vividly on diminishing the light again. The purplish red soon appears, unless the original dazzling were very slight when the change may not pass beyond the green stage.

This green phase is very transient and is faint, indeed sometimes hardly noted on the *white* squares—occasionally not even noted on black squares, as at this early stage the general vision of the eye is very poor from the dazzling.

In marked cases fifteen seconds elapsed before the red purple vision was noticeable. It begins at edge of white and spreads over them, while the black squares, where they glistened, also appeared reddish, but where most black were greenish.

The whole phenomenon takes one to two minutes to reach a maximum and then rapidly disappears, four minutes in all covering its duration.

The slighter the preceding dazzling the weaker is the Erythropsia, sometimes an orange tinge may precede and follow the Erythropsia

and in faint cases only the orange color may be observed. If the illumination be suddenly increased the Erythropsia is more vivid, thus differing from the green vision.

This may be due to the retina being rested in the shade and reacting more lively to the increased stimulation.

The field as observed by the perimeter is interesting.

As a rule the Erythropsia, unless it be very vivid fails in area of 3 to 5° from the center outwards, but if very vivid may be observable here.

The extent which the Erythropsia reaches towards the periphery far exceeds that of the normal red field, indeed in marked cases it may extend to the limits of the white field, and again as it fades it gradually contracts to the narrow ring surrounding the center.

Occasionally the fading took place from within outwards.

The center as observed through a stenopaic aperture appeared darkish violet surrounded by a green shadow, or sometimes it was entirely green. Sometimes also outside of this green area of the center but inside the capillary zone was a reddish band.

As the Erythropsia of the peripheral part of the field increased, the green of the center did likewise while here and there little red spots could be noticed in it. With decrudescence of the Erythropsia the center became colorless while the periphery of its non-vascular area became rosy or the green of the central spot extended over the whole non-vascular area.

Fuchs composed his color perceptions with a solution of Fuchsin, 0.1 ccm. of an alcoholic solution of Fuchsin in 2 litres of water. This was put in a wedge-shaped glass, hence the shade varied with the breadth of the glass.

All colored objects appeared red, their real color only be appreciated as they were brought near the fixation point.

After Erythropsia had disappeared no variation was found in the normal field for colors.

As a result of placing colored glasses in front of the eye while making the experiments, it was found that the Erythropsia was independent of the color of the stimulating light.

If the dazzling were too faint, then only the after image of the colored glass was seen. Erythropsia not developing, otherwise, however, it was most marked.

Sometimes after the experiments were finished, the snow would appear faintly rosey from time to time, in wave-like phases, as is occasionally

observed by the eye with undilated pupil when one has gazed for a length of time on the bright.

In *aphakic* eyes, the green stage was not noted, it also required quarter to half an hour for it to develop after coming into a shaded place. In the center the red was fainter—it did not extend so far toward the periphery of the field as in the normal field. The Erythropsia lasted from an hour to a day, and easily recurred on following days, especially on awaking or on lighting a candle. This recurrence tendency is the main difference from normal eyes. The colors and the spectral pigment changes were the same as in normal eyes.

In the *Color-blind*—if green blind, the green stage and green vision at the center was wanting.

In *Hemeralopia* (congenital) the result was a clear but faint Erythropsia.

In aphakic eyes, after operation, we get frequently blue vision and sometimes red vision, i. e., green blindness. Both may exist in the same eyes.

As to the light sense in aphakic eyes, it is worth while to notice it as bearing on this subject of Erythropsia.

The lens normally absorbs some violet and ultra-violet rays and changes others in virtue of its own fluorescence into rays of greater wave length.

In the yellowish senile lens many blue waves are also absorbed.

In the absence of the lens such a quantity of short wave rays entering the eye, use up the visual substance of the retina more rapidly than in eyes possessed of lenses. The retina now requires longer to recover and adapt itself to ordinary light than the normal eye, but it would appear no permanent injury is done to the eye.

Professor Fuchs now offers a good and elaborate explanation of the phenomena.

All daylight is reddish, and is only considered white, inasmuch as our retina after prolonged exposure to any prevailing color regards it as white.

To decide the color of anything accurately and especially in this case of the light reflected from the snow we study its after image.

That of the snow is violet and as dark objects seen on the snow appear dark still, the after image is positive, hence the primary color of the snow light is violet. Later the violet after passing through meances of green becomes purplish and the dark objects clear and violet; this is then a negative after image, and is complementary in color.

The greenish phase of these after images can be obtained by prolonged exposure of the eye to bright snow light but differs from the pro-erythroptic green in that it is most clearly seen on the light areas of the chessboard, as all complementary colors are.

The Erythroptia is not a positive after image nor is it a complementary color as it occurs entirely independently of the color of the stimulating light and various other differences are cited especially the fact that projected on a clear or dark ground, the green and reddish images are not complementary and are markedly independent of one another.

Again Erythroptia is very weak or fails in the center of the field, being the very opposite to after images, which are intensest at the center and weak at the periphery.

Fuchs' theory of the Erythroptia is that they are dioptric phenomena due to the visual purple becoming visible.

This theory would fail of course when these "dazzle images" (as Fuchs calls them) are seen on a dark field (eyes closed).

Here is however no Erythroptia, and it must be explained on the old theory of tiring and recuperation of the retina, which also would account for the marked independence of the color images seen with the open and closed eye.

The retina is purple, and it has been shown to be visible under certain conditions.

We do not observe it continually because it is always present and is also present over the whole field, just as old people do not observe the yellowish color of their lenses.

From long exposure to snow light, the violet and ultra-violet rays bleach the purple and the reproduction going on in a shaded place is so rapid and intense that we become aware of it.

The question is how the rays of light act. They may be reflected from the pigmented outer ends of the rods and the pigment epithelium on to the cones, the short waved violet rays being most active and easily reflected.

Kuhne says the usual purple is reformed afresh and also from pre-existing "visual white," the latter passing through shades of orange, citron and red to purple.

J. W. STIRLING.

REPORTS OF SOCIETIES.

SECTION ON OPHTHALMOLOGY.

College of Physicians of Philadelphia.

Meeting of the Section on Ophthalmology of the College of Physicians, November 17, 1896.

Dr. J. M. Da Costa in the chair.

Unilateral Albuminuric Retinitis, with a case, by G. E. de Schweinitz, M. D. After a brief review of the literature of unilateral albuminuric retinitis, during which reference was made to fifteen cases, Dr. de Schweinitz reported two examples that had come under his care, both in colored men. In the one instance clinical examination indicated chronic nephritis, and there was unilateral neuro-retinitis. The patient, however, was not seen again and his subsequent history was unknown. In the second case the patient had been under observation for five months, and had all the symptoms of chronic interstitial nephritis with unilateral (right side) retinal lesions. Water colors by Miss Washington, illustrating the condition in two stages, were presented, indicating that the primary lesion had probably been a thrombosis in the lower nasal vein with secondary involvement of the disc and retina. Dr. de Schweinitz agreed with Knies that unilateral albuminuric retinitis is not so great a rarity as some text-books would lead us to believe. A certain percentage of cases maintain monocular lesions until death; in another the unilateral character of the affection is maintained for a considerable portion of time, but ultimately becomes bilateral. Dr. de Schweinitz suggested that an interesting clinical observation in these unilateral cases would result from catheterization of the ureters and separate analysis of the urine from each kidney. His patient had declined to submit to this procedure.

Discussion.—Dr. J. M. Da Costa: Has there been microscopic examinations in cases of this character? This question is suggested because it is uncommon to have one kidney alone affected.

Dr. de Schweinitz: So far as I am aware, but one post-mortem is recorded, namely, Yvert's case. The right kidney alone, in a state of parenchymatous nephritis, was present, but although Yvert is a French military surgeon and reports with characteristic exactness, if my memory serves me correctly, there was no microscopic examination, but only a description of the coarse pathologic anatomy of the specimen. Cheatham is often credited with an autopsy, especially in foreign abstracts, but his report contains clinical data only, and the autopsy referred to in his paper is the French case just described.

Dr. Wm. F. Norris: I should like Dr. Da Costa's opinion as to why one kidney, any more than one eye, should be the sole sufferer.

Dr. Da Costa: I suppose if I were to theorize I should explain it through the action of the sympathetic nerve, and assume it to be for the same reason that there is flush in pneumonia on that side of the cheek corresponding to the side of the affected lung. This is a very common clinical observation and is the only analogy that occurs to me. I know of nothing from observation that bears on this point.

Report of the Successful Removal of a Piece of Steel from the Vitreous by the Hirschberg Magnet, and exhibition of the patient, by G. Oram Ring, M. D. J. S., aged 28, was admitted to the wards of the Episcopal Hospital, June, 1896. Six hours previously a piece of steel from an anvil penetrated the right lower lid and the ocular coats, and was lodged in the nasal side of the anterior portion of the vitreous where its position could be distinctly outlined. The cornea, iris and lens were uninjured. A minute bead of vitreous protruded from the wound in the sclera. The choroid was ruptured and retinal hemorrhage was profuse at the site of the injury, V. $\frac{2}{3}$. The following day, under antiseptic and cocain anesthesia, an incision was made with a Graefe knife through the conjunctiva and sclera 6 mm. from the corneal border and opposite its lower third. While the edges were retraced by an assistant, the straight tip of a Hirschberg magnet was inserted. Upon withdrawal of the magnet, after its second introduction, a piece of steel 6x2x1 mm. was found clinging to it. No sutures were used. Recovery was prompt and uneventful. A patch of atrophied choroid corresponding to the rupture can be seen through the now transparent vitreous. The vision has increased to $\frac{3}{8}$.

A Case of Foreign Body in the Vitreous, with exhibition of the patient, by M. W. Zimmerman, M. D. The patient, J. J., was wounded by the explosion of a copper dynamite cartridge January 18, 1890. The fragment entered the sclera of the left eye 7 to 8 mm. to the nasal side of the corneal limbus. Blood filled the anterior chamber for two days. After absorption the foreign body could be seen in the vitreous opposite the base of the iris on the temporal side. A drawing made at this time represents exactly its present position and appearance. One year later there was a moderate hyalitis of unknown origin, and confined to this eye, ending in complete recovery. The patient was treated at this time by the late Dr. George T. Lewis, whose notes furnish the above facts. The boy consulted me first in March, 1896, on account of accommodative asthenopia. A weak hyperopic cylinder

relieved the symptoms and gave normal vision, which has continued. The presence and unaltered position of a piece of copper for seven years without irritation gave interest to the case, and particularly in view of the opinion of Leber and others, that copper is more dangerous to the safety of the eye than other metals. In this case the fragment has become lightly encysted and gives no metallic reflex, excepting in a very dark room, where it emits to the illumination of the ophthalmoscopic mirror a reddish tinge.

Discussion. —Dr. G. C. Harlan had the opportunity of following a case in which a piece of gun-cap had been imbedded in the retina for three years, without causing irritation.

Dr. Chas. H. Thomas: Several years ago I had under my care a group of cases of gun-cap injuries to the eye. In all, on account of rapid degeneration and threatening sympathetic ophthalmia, I was obliged to enucleate, although in two cases the foreign body had been carried for periods of eighteen and twenty-two years, respectively.

Dr. S. D. Risley asked the President if he recalled to mind the eye enucleated at the University Hospital some years ago, where a foreign body was found sticking in the end of the optic nerve, the presence of which had not been suspected.

Dr. B. A. Randall spoke of another case in which the foreign body had remained quiescent for a long time. He believes that such results are due to encapsulation of the foreign substance. There was an interesting case which he drew for Dr. Norris at the University Hospital some ten years ago, as he may remember, where the bright piece of gun-cap was visible at the lower margin of the pupil, suspended in the remains of the lens capsule, and giving rise to little irritation; whence it was successfully removed by operation.

Dr. Norris: I recollect very well the two cases that have been mentioned; the piece of metal which I extracted from the anterior chamber was a movable one; the patient could throw the foreign body from the anterior to the posterior chamber at will. I have no doubt the ultimate trouble was due to mechanical irritation as well as to the fact that the foreign body was copper. If I recollect aright, the man had some sight in the eye, although greatly impaired. It has always seemed to me that the reaction from these materials depended, first, on their asepsis at the time they entered the eye, and, secondly, on their state of comminution. All the Fellows are probably aware of Leber's ingenious experiments on this subject; he was very careful to introduce aseptic material, but the metals which he chose for this purpose were always

in the finest state of pulverization, so that they were in the most favorable condition to be acted on by fluids of the eye. The copper and lead were promptly acted on and caused inflammatory reaction in the vitreous and retina; while the so called "noble metals," gold and silver, in a similar state of pulverization, produced the same effects to a less degree. On the other hand, there are quite a number of cases where metallic foreign bodies have remained in the eye for a very long time without injurious results. Jäger has related a case where he watched for years a foreign body in the vitreous, which was apparently absolutely harmless as long as it remained encapsuled, and when it subsequently, some years later, sank in the vitreous, it commenced to make trouble. Of course, if there is a good layer of fibrin around one of these foreign bodies, there is less chance for chemical action and corrosion by the fluids of the eye and for absorption of metallic salts.

Dr. Howard F. Hansell: I would like to refer to a case that is still under treatment. One year ago the patient applied at the Jefferson College Hospital, and we determined the presence of a piece of steel in the eye. The inflammatory symptoms, however, subsided, and since he lived in Philadelphia and was easily accessible, we adopted the expectant treatment. The vision was lost and the eye gradually atrophied. This year he came back with opaque lens, discolored iris, atrophic eye, and a great deal of pain; he asked that something should be done for it. He was sent to the Polyclinic Hospital for examination by the Röntgen ray process, not so much to determine whether a foreign body was there, but to learn whether the rays would show the shadow. Dr. Stern, with a great deal of patience and skill, was able to get a beautiful skiagraph showing the presence of the foreign body. We endeavored to remove the steel by means of a magnet, but were unsuccessful. I then enucleated the eye and found a piece of steel $\frac{3}{8}$ of an inch long, caught in the ciliary body.

In answer to a question of Dr. Oliver, Dr. Hansell explained the method adopted by Dr. Stern, as follows: The plate was made fast against the man's temple, then by means of a lead funnel the rays were directed toward the inner angle of the eye of the other side, and passing through the nasal bones the outline of the outer angle of the orbit was distinctly shown. The steel was in the ciliary region and cast a well-defined shadow, while the eye itself was dimly outlined.

I may say, in this connection, that my friend, Dr. Clark, in Columbus, has made some successful experiments with this process, and has been

unable to determine the presence of a foreign body posterior to the iris by thrusting a very narrow plate covered with rubber up the nostrils.

Dr. Hansell read a paper upon *Report of the Successful Removal of a Piece of Steel from the Vitreous by the Hirschberg Magnet*, and exhibited the patient. J. S. received a small fragment of metal in the left eye in April, 1896. After the transient discomfort had subsided, he gave the accident no further thought, until it was revived in his memory by the questions asked when he applied in October at the Jefferson Hospital, on account of failing vision and inflammation in the eye. A bright reflecting piece of metal could be readily seen with the ophthalmoscope floating in the vitreous, and small scar below, and to the outside of the corneal limbus, was found, after careful searching. V. $\frac{2}{3}$. An incision through the conjunctiva and sclera between the external and inferior rectus was made, through which the smallest tip of the Hirschberg magnet was inserted. After two unsuccessful efforts, a small triangular, corroded piece of steel was removed with the loss of an insignificant amount of vitreous. In one week the vision was $\frac{3}{4}$. Three points may be noticed in connection with this case; namely, the comparatively long time between the entrance of the steel and its removal, the retractions of the edges of the scleral cut as the tip of the magnet was withdrawn, and the recovery of excellent vision.

Dr. Charles A. Oliver presented a *Brief Clinical and Histologic Study of a Case of Epithelioma of the Corneo-Scleral Junction*. The condition was found in a sixty-nine year old man. The growth first manifested itself as a small "pimple" at the lower outer corneal border of the right eye, and gradually and painlessly increased in size. When first seen, it appeared as a fleshy and wart-like looking mass about the size of a pea, and embraced an area equal to almost the outer quadrant of the cornea,

In spite of careful excision with free thermo-cauterization repeated more extensively some two months later, the mass recurred until in four months' time it had become so great in size and so angry in appearance, that the eyeball with the surrounding conjunctiva was removed, the operation, by reason of renal and cardiac disease in a weak and feeble patient, being almost painlessly done during local anesthesia by the use of hydrochlorate of cocaine. Up to present writing there has not been any recurrence.

From a clinical standpoint the case is most interesting. Commencing as a "pimple" in the epithelial structures of the conjunctiva at the transition-border between the cornea and sclera, as is almost

universal in such cases, the mass gradually and painlessly increased in size until it assumed the papillomatous variety of growth. It then extended into and beneath the epithelium of the cornea far in toward the summit of the membrane. In other words the tumor-mass evidenced its development and growth in a manner that is eminently characteristic of epitheliomatous formations.

The quick recurrence and steady increase of the growth, in defiance of the extreme radical measures employed for extirpation, manifestly evidenced the necessity of removal of the entire field of malignancy. The almost uncontrollable oozing of blood, experienced during the operative procedure, plainly showed the extreme vascularity of the neoplasm.

Microscopically, the specimen was exceedingly instructive, not only by reason of presenting the characteristic appearance of epitheliomatous formation in the region involved, but on account of the undoubted protrusion of the epithelial cells into the interlamellar corneal spaces (which possibly might have been produced or rendered more easy by the operative procedures pursued in the earlier stages of the disease), and the insertion of the same form of malignant cells into the superficial layers of the sclera (layers which were untouched by operation); but is also of great interest in substantiating the view that the deepest penetration of the epithelial cells into the outermost tunics of the eye were in the transition-zone between the cornea and the sclera—that is, at the corneo-scleral junction.

Dr. Oliver exhibited a series of *Ophthalmoscopic Pictures of Peculiar and Rare Chorio-Retinal Changes, the Result of Traumatism*. The first of this grouping was seen but a few hours after the patient, a man of forty-two years of age, had been struck in the left eye by a fist. Almost total blindness ensued immediately after the accident.

The eyeball was unruptured. The cornea seemed unusually brilliant. The anterior chamber was deepened, especially in its peripheral portion. The pupil was round, and the iris, though tremulous, was mobile to consensual reaction. The lens was dislocated directly back, its superior border resting against the retina just behind the inferior portion of the equator of the globe. The vitreous humor contained some rather fixed, doubtful streaks of blood in its anterior portion.

As shown in a water-color sketch made by Miss Washington, the optic disc was greenish in tint and appeared bloodless. There were a few deeply situated hemorrhages in the retina, and a series of large

choroidal ones extending along the retinal vessels, which were reduced to mere threads. There were broad and greenish elevated areas, as though the deeper retinal tissues against the choroid were thickened, swollen, and opaque. The patient became blind in a few minutes and never regained vision.

In contrast with this sketch, which illustrated the grossest effects as seen ophthalmoscopically from concussion accidents, Dr. Oliver exhibited water-color drawings of five other cases extending from minor degrees of visible change to the more pronounced varieties, one of which (the fourth example) closely resembled the chromolithograph in Jonathan Hutchinson, Jr.'s, well-known case.

Discussion.—Dr. Harlan thought that in order to explain the blindness in Dr. Oliver's first case, there must have been injury to the retro-bulbar portion of the optic nerve resulting in a fracture of the orbit. In this Dr. Oliver coincided, believing this was proved by the bloodless condition of the optic nerve head and the greatly marked reduction of the main retinal trunks.

Dr. S. D. Risley: Some years ago I reported to this Section the history of a case to which my attention was called while absent on my summer vacation. A man had been thrown from a hay-rake, and was struck in the temple fossa by one of the teeth, which penetrated the soft tissues deeply and probably caused a fracture of the orbital plate. I found advanced atrophy of the optic nerve, marked infiltration of the tissues surrounding it, and large white patches in the macula and throughout the temporal half of the eye-ground, apparently the site of extensive hemorrhages, as remnants of the clots were still visible. In this case there had probably been a post-ocular hemorrhage following a temporary *exophthalmos*.

Dr. B. A. Randall: A case that I reported to the American Ophthalmological Society ten or twelve years ago had a little peculiarity which may have a bearing upon some of the peculiar appearances of the eye-ground. There was, as the result of traumatism, rupture near the disc, especially interesting and peculiar in that it passed up on the temporal side of the disc to its upper margin and then was lost in a rounded area to the nasal side that looked as if it had been subjected to torsion. The result was an inflammatory lesion leading to complete atrophy.

Dr. Edward Jackson presented a case of *Deficiency of Pigment, allowing the Fundus Reflex to Show through the Iris*. At a former meeting of the Section he had shown a similar case. Both of these

patients had undergone cataract extraction; in the one shown this evening there was rupture of the sphincter, the lens having proven to be larger than the average. It was the only time he had met this accident in simple extraction. The fundus reflex showed through other parts of the iris almost as readily as through the part at which the rupture occurred. Possibly it might be that there were other ruptures of the iris, but the distribution of the fundus reflex was entirely different from that indicating rupture of the iris. It constituted a general area of red against which the details of the iris were seen. It was a regular rounded area, and did not consist of fissures through which red reflex could be obtained. It could hardly be regarded as a rupture of the posterior layer of the iris because there was no change in the outline of the pupil. There was no deformity of the pupil in the case previously reported. Rupture of the posterior layer would necessarily cause deformity in the pupil, certainly a rupture of such considerable size. The posterior layer opposes the action of the sphincter, and the two together give the pupil its form. It is quite possible that this appearance is the result of atrophy of the pigment cells from stretching of the iris, but probably it is simply an atrophy comparable to the changes in the choroid in the eyes of many old people. Attention is called to this condition, one that may readily be overlooked, since it is perhaps more common than the two cases would seem to indicate. It is brought out while illuminating the fundus as much as possible, at the same time leaving the affected part of the iris in comparative darkness. As only three weeks had elapsed since the extraction, the time was too short for any extensive atrophy to occur. The pigment of the iris was not rubbed off by the lens in its passage through the pupil.

HOWARD F. HANSELL

Clerk of Section.

THE OPHTHALMIC RECORD

A Monthly Review of the Progress of Ophthalmology.

VOL. VI.

CHICAGO, FEBRUARY 1897.

NO. 2. NEW SERIES.

EDITORIALS.

Recent improvements in the skiagraph have enabled ophthalmic surgeons to utilize the X-Rays in the detection and localization of bodies that have found lodgment within the globe when their presence could not be detected by the ophthalmoscope. In a discussion of a paper read at the November session of the Chicago Academy of Medicine Dr. Casey Wood drew attention to the fact that hitherto the bony orbit had proved impenetrable to the rays, or at least had so interfered with the skiagraphic process that the Roentgen apparatus, in all the attempts so far made and reported, had proved practically valueless. Recent reports of cases show that even before the date of this meeting, Dr. Max Stern, of the Philadelphia Polyclinic, had succeeded in obtaining the most accurate pictures of foreign bodies lodged within the eyeballs of patients that were subsequently operated upon with brilliant results, by Drs. Hansell, de Schweinitz, Oram Ring and others. In Dr. de Schweinitz' case, which we hope to report in the next number of the RECORD, two previous magnet operations had been done without effect, the extraction of the foreign body easily following the operation performed in the particular region indicated by the skiagraph. Doubtless we shall also have reported additional instances of the same kind, thus making a distinct advance in ophthalmic surgery.

Some time ago one of the editors of the RECORD contended in the columns of a journal devoted to general medicine, that the use of

cycloplegia and *mydriasis* as synonymous terms and of *mydriatic* and *cycloplegic* as interchangeable adjectives and adjective-nouns is one of the commonest errors one meets with in medical literature. There seems to be reason for reasserting this statement and to point out that a mydriatic may be, but is not necessarily, a cycloplegic, even though a cycloplegic is usually a mydriatic. A giant is always a man, but men are not necessarily giants. The electric current and a quarter-grain solution of cocain are, under certain conditions, mydriatics but neither of them is a cycloplegic. If one wishes to refer specifically to the dilation of the pupil the ancient term *mydriasis* should be employed, reserving the modern word *cycloplegia* (from *kuklos*, a circle, i. e. the ciliaryring and *plege*, a stroke) for indicating a paralysis of the ciliary muscle.

C. A. W.

Owing to some defects in the printing of the Chromolithograph illustrative of Dr. Beard's article in the January number of the RECORD, it was decided to inclose a corrected copy in the February issue. Subscribers may thus substitute the latter print for the first one sent them.

MISCELLANEOUS.

Dr. H. V. Würdemann has removed from 805 Grand Ave. to the Pierce Building, Suites 40 and 41, No. 128 Wisconsin st.; Milwaukee.

PROGRAMME OF THE PAPERS ON OPHTHALMOLOGY TO BE PRESENTED TO THE WESTERN OPHTHALMO- LOGICAL, OTOLOGICAL, LARYNGOLOGICAL AND RHINOLOGICAL ASSOCIATION.

Second Annual Meeting, St. Louis, Mo., April Eighth and Ninth, 1897.

PRESENTATION OF PAPERS IN OPHTHALMOLOGY.

A Pyramidal and Senile Cataract in one subject, Report of a Case.

Dr. George F. Suker, Toledo, Ohio.

A Case of Oculo-Motor Paralysis.

Dr. Geo. E. Bellows, Kansas City, Mo.

- Some Observations upon the Irritating Effects of Natural Gas upon
Trachoma. Dr. John Johnson Kyle, Marion, Ind.
- Astigmatism. Dr. Dudley S. Reynolds, Louisville, Ky.
- Skin Grafting for Malignancy of the Orbit and Entropion.
Dr. Flavel B. Tiffany, Kansas City, Mo.
- Restoration of the Eye Lids by Skin Grafting,
Dr. W. C. Tyree, Kansas City, Mo.
- An Improved Skiascope. Dr. J. Ellis Jennings, St. Louis, Mo.
- Scopolamine as a Mydriatic and Cycloplegic.
Dr. Wm. S. Fowler, Chicago, Ill.
- Optic Neuritis. Dr. F. C. Evans, Louisville, Ky.
- Report of a Case of Congenital Membraneous Cataract with
Aphakia. Dr. A. S. Magee, Topeka, Kansas.
- Moderate Errors of Refraction: Shall We Always Correct Them
Dr. Albert E. Bulson, Ft. Wayne, Ind.
- Mental Depression and Prolonged Melancholia Following Graduated
Tenotomy and the Limitation of Prisms.
Dr. W. H. Baker, Lynchburg, Va.
- Keratoconus. Dr. J. W. Bullard, Pawnee City, Neb.
- A Case of Inflammatory Glaucoma of Reflex Nasal Origin.
Dr. J. Aloysius Mullen, Houston, Tex.
- Syphilitic Amblyopia. Dr. Robt. F. Lemond, Denver, Colo.
- Congenital Nystagmus. Dr. J. Elliott Colburn, Chicago, Ill.
- College Instruction in Ophthalmology.
Dr. A. M. Lapsley, Keokuk, Ia.
- The Value of Hypnotic Suggestion in Ophthalmic Practice.
Dr. Jgnatz Mayer, Guthrie, Ok. Ty.
- Description of Dr. McCassy's Trial Frame, and Lachrymal Style and
Threaded Handle. Dr. J. H. Johnson, Kansas City, Mo.
- The Aetiology, Treatment and Prognosis in Exophthalmic Goitre.
Dr. J. Fred Clark, Fairfield, Ia.
- Extraction of Bilateral Soft Cataract in the Case of a Child Three
Years Old. Dr. J. O. McReynolds, Dallas, Tex.

Friday, April 9th.

Session at 8.30 o'clock.

PAPERS.

- Ulcers of the Cornea. Dr. H. Z. Gill, Pittsburgh, Kans.
- The Relative Value of Enucleation and Evisceration.
Dr. A. R. Amos, Des Moines, Ia.

A Plea for More Mild Treatment of the Conjunctiva.

Dr. E. W. Ames, Canton, Ill.

Thrombosis of the Lateral Sinus.

Dr. B. F. Church, Dallas, Tex.

Chronic Rhinitis as a Factor in Weakened Vision.

Dr. Joseph A. Daniel, Davenport, Ia.

Treatment of Corneal Lesions by Hydraulic Curetting with Sublimate Solutions.

Dr. C. H. Pleasants, Helena, Mont.

Toleration of the Eye to Severe Injuries.

Dr. H. G. Sherman, Cleveland, O.

HAL FOSTER, *Secretary*.

When remitting the amount of your subscription by local check please include fifteen cents additional to cover cost of making collection through our bank. Preferably remit \$3.00 by New York or Chicago draft, postal or express money order. By observing this you will not only confer a favor on the publisher but spare him an unnecessary expense.

Dr. J. W. Sherer, of Philadelphia, will be associated with Dr. Würdemann after January 15th, 1896.

Dr. C. W. Root, who has been with Dr. Würdemann for two years, has gone to Philadelphia.

THE OPHTHALMIC RECORD

VOL. VI.

CHICAGO, MARCH, 1897.

NO. 3, NEW SERIES.

ORIGINAL ARTICLES.

THE INFLUENCE OF NASAL DISEASE IN MODIFYING THE QUANTITY AND AXIS OF CORNEAL ASTIG- MATISM.

By LOUIS J. LAUTENBACH, M. D.
Philadelphia.

The regular and systematic recording of the corneal curvatures is not only useful but is exceedingly interesting and often instructive, shedding light upon obscure conditions and presenting for solution new problems which otherwise had not even been recognized. Having for some years made it a rule invariably to study the corneal surface at the visual pole, recording the axis of greatest and of least refraction, the diopters of refractive difference, and the diameters of curvature, I have, I believe, determined that pathologic conditions of the nasal organs sometimes influence corneal refraction and corneal astigmatism.

In a paper read before the American Medical Association in 1895,¹ I presented in an amplified form some observations placed before the Phila. County Medical Society² the preceding year, and endeavored in addition to explain in the simplest way possible, the production of the normal corneal curvatures and their pathological departures. I explained the production of the corneal curves and of normal astigmatism in a purely mechanical manner, claiming that the corneal surface

1. On the Local and General Conditions that Change Corneal Curvatures. Read in the Section of Ophthalmology at the 40th Annual Meeting of the Amer. Medical Association, May 1895.

2. Some observations on Corneal Astigmatism and Conditions that Change Corneal Curvatures. Read before the Phila. County Medical Society, June 27, 1894.

is the result of numerous pressure forces upon the eye ball, acting from within as well as from without; that the growing function of the cornea was to some extent controlled by the pressure from within the globe—the ball's tension and the action of the ciliary muscle—and also by pressure from without—the tension of the contents of the orbital cavity and that exerted by the motor muscles as well as the pressure of the eyelids. That as a result of the perfect adaptation of these various forces, we have produced corneae of perfect curves. That when from disease, accident or otherwise any of these counteracting forces became either too weak or too strong, we had produced abnormalities of the corneal curvatures with abnormal astigmatism in axis or degree, or both. That these alterations of curves were either temporary, progressive or permanent, depending upon their causation.

Since this presentation of the subject, I have become more and more convinced of the influence exerted by nasal diseases upon the cornea. It has become more deeply impressed because of the fact that when this connection is determined, improvement follows almost invariably upon relieving the nasal conditions.

In studying my cases of astigmatism with the rule, I have observed that the axis of least refraction when not exactly vertical is more often to the outer (between 45° and 90° in the right eye, and between 135° and 90° in the left eye) than to the inner side of this axis—in my last hundred cases the proportion is 55 to 45. I find almost all of these cases present catarrhal disease of the nasal fossae. In those cases where the axis presents to the outer side of 90° , the disease is almost invariably in the nature of thickenings, hypertrophies and polypi; whereas, in the other group, the axis presenting within the vertical line, atrophic conditions as well as nearly normal nasal fossae were far more common. As yet I am not absolutely sure as to the factors determining the swinging inwards or outwards of the axis of least curvature, but strongly suspect it to be due to nerve stimulation manifesting itself in an increased action of the oblique muscles. In these cases I have obtained, after thorough nose treatment, a change in the axis of from 5° to 20° toward the vertical. While this change in the nasal conditions is occasioning a return to a normal corneal axis, it is often observed that the patient's eye symptoms change correspondingly. The head pains, asthenopia, photophobia, giddiness, sick stomach and eye aches vary in intensity, and the glasses which may have been perfectly comfortable when the patient first presented himself, often become useless or even painful.

Often in consequence of this apparent excess of eye symptoms following the institution of nasal treatment, patients become discouraged and dissatisfied and even seek another physician, fearing that their refractive error has not been properly corrected, only to receive a glass which within a few months proves useless. Many of the chronic glass changers, undoubtedly, are simply cases of varying astigmatism caused by nasal disease. It is not at all uncommon to find a patient, wearing constant glasses, presenting himself with nasal symptoms which suggest that the "off" axis astigmatism discovered, has been thus occasioned, there being no symptoms to suggest anything wrong with the glasses. As the nasal treatment progresses toward the third or fourth month, eye symptoms appear and by the ophthalmometer we find a change of from 5 to 15 toward the normal axis, with often a change in the amount of astigmatism: the removal of the nasal irritation has allowed a return to a more normal and evenly balanced condition of the eyeball. Such histories are not uncommon. It is often hard to so thoroughly explain this condition to the average patient as to make him see the purpose and value of the nasal work, and in the face of apparent discouragement, persist for a matter of, perhaps, months in following out the nasal treatment.

To explain the phenomena above indicated, it is but necessary to call attention to the intimate relation existing between the blood vessels of the nasal cavities and those of the eye and its appendages, especially their anastomoses; the direct mucous connection of these organs through the ductus nasalis; and especially to direct attention to the intimate relations which exist between the nervous supply of the nose and that of the eye. The fossae of the nose are supplied by the nasal branch of the ophthalmic nerve of the trifacial, branches of which supply the eye appendages and eye ball— one of the branches of the nasal nerve is the long root of the lenticular ganglion, while the inferior oblique branch of the motor oculi (supplying all the eye muscles except the external rectus and superior oblique) forms the short root. The trochlear nerve, which supplies the superior oblique muscle, arises close to the origin of the trifacial and is connected with this nerve at its origin by a transverse band. It is often blended with the ophthalmic division of the trifacial and occasionally gives off a branch to assist in the formation of the lachrymal nerve. The abducens nerve, which supplies the external rectus, is joined by a filament of the ophthalmic. We thus see that the two muscles which govern the motion of the eyeball on its axis, the superior and inferior oblique,

are supplied by the oculo-motor and trochlear nerves, which are directly connected with the nasal branch of the ophthalmic, the former by means of the lenticular ganglion, and the latter through the connection at its origin as well as in its course to the ophthalmic and lachrymal branches.

The superior oblique muscle by its over action occasions temporal deviation of the lower and of the normal vertical axis, while the inferior in like manner causes nasal deviation. The oculo-motor abducens, ophthalmic and nasal nerves being related as described the recti muscles are seen to be subject to modifications of action from irritations presented at the nasal nerve endings. It can readily be seen that any disturbance of the peripheral ends of the nasal nerve can affect either of the oblique or any of the recti muscles, and that a change of axis can be occasioned by over or under action of either or both oblique muscles, while the quantity of the astigmatism can be varied either by the nasal irritation being transmitted to the recti muscles or the oblique muscles, or to both.

The realization of the occurrence of these alterations in the axis and curvatures of the corneal meridians as due to disease of the nasal cavities will, I am sure, serve to throw light on many a hitherto obscure or misunderstood experience, and will allow us to give our patients more accurate and positive results in a line of cases which hitherto have proved so discouraging to both physician and patient.

A CASE OF AMBLYOPIA FROM A LARGE DOSE OF QUININE SULPHATE.

By HERBERT HARLAN, A.M. M.D.

Of Baltimore

ILLUSTRATED.

J. T. G., Age 34, house painter by trade, has been for a number of years a frequent inmate of various hospitals in this city. He gets drunk frequently and on several occasions has taken large doses of laudanum and once, some years back, in a fit of despondency he took a dose of aconite with suicidal intent.

On Nov 16, '96 when he had been drinking some, but by his own account was not drunk, he went into a drug store and asked a kindly disposed druggist for some medicine to relieve a pain in his side. When the druggist went back to get him something he pocketed from the counter a bottle containing 100 two grain pills of sulphate of quinine, put up by McKesson and Robbins. After leaving the store he took a handful of these pills, a little later he took some more and perhaps an hour later he finished the bottle along with a glass of beer. This was about 2 p.m. A half hour later feeling a peculiar rumbling in the head he went to another drug store and obtained an ounce of laudanum. This he took at once and then made his way to the Good Samaritan Hospital where he stated that he had taken laudanum and asked to be admitted and to have something done for him. His story did not receive much credence but after a little he fell unconscious in the vestibule. He was then taken in hand. His stomach was pumped out and the contents unquestionably contained laudanum from the odor. He was also given some permanganate of potassium and and $\frac{1}{160}$ gr of atropia hypodermically. It was noticed that his pupils were dilated. This was about 5 p.m. He came around after awhile and was put to bed in the ward. Next morning he seemed well but claimed to be entirely blind and his pupils were widely dilated. The visiting physician knowing the man and knowing nothing of the quinine thought he was malingering and that the dilated pupils came from the atropia. He passed no urine until the morning of the second day. The small quantity then passed was tested for albumen and none found. On this day he first told of having taken 200 grains of quinine which at once made the diagnosis clear.

On Nov. 20th I was asked to see him and take charge of the case. He was then entirely blind, without any recognition of the light from the ophthalmoscope mirror. The pupils were widely dilated. The nerves were white and the vessels of the fundus diminished to the merest threads. There was no red spot at the fovea but the retina had the appearance caused by embolism of the central retinal artery. It was not perfectly transparent. It appeared to me, with the ophthalmoscope, as a retina does in an eye that has been removed from a man some hours dead.

Stychnine was ordered and a prognosis given favorable to the restoration of useful vision.

I was out of the city for a week following and saw the case next on Nov 30th. Then the pupils were still dilated but responded slightly to bright daylight and he had some telescopic vision. For instance when I held my outstretched hand 6 inches from his face he failed to see it at all but saw and correctly located one of my eyes between the fingers and he saw the position of the nurse's hand across the room.

Dec. 10th his central vision was R $\frac{1}{20}$ and L $\frac{1}{20}$ —and better, $\frac{1}{10}$, with the two eyes. The fields were as shown in the cuts.

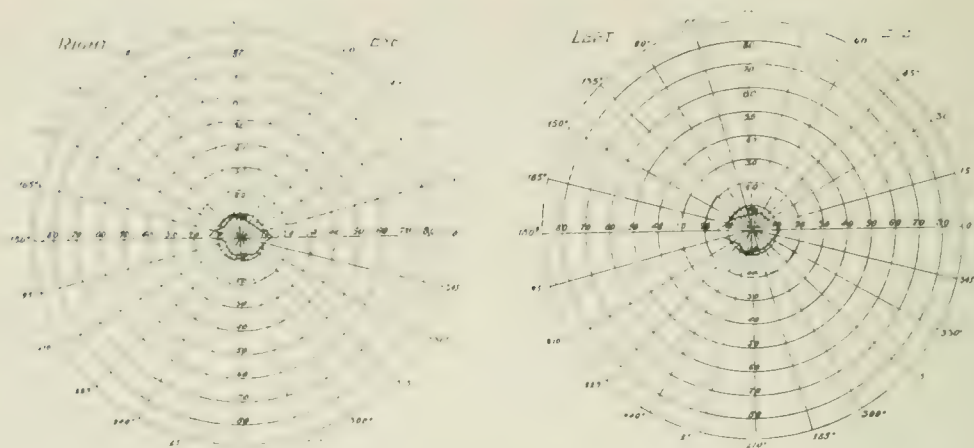


Fig. 1.

Dec. 10th, 1896. After 24 days.

He read Jaeger No 4 and matched colors perfectly.

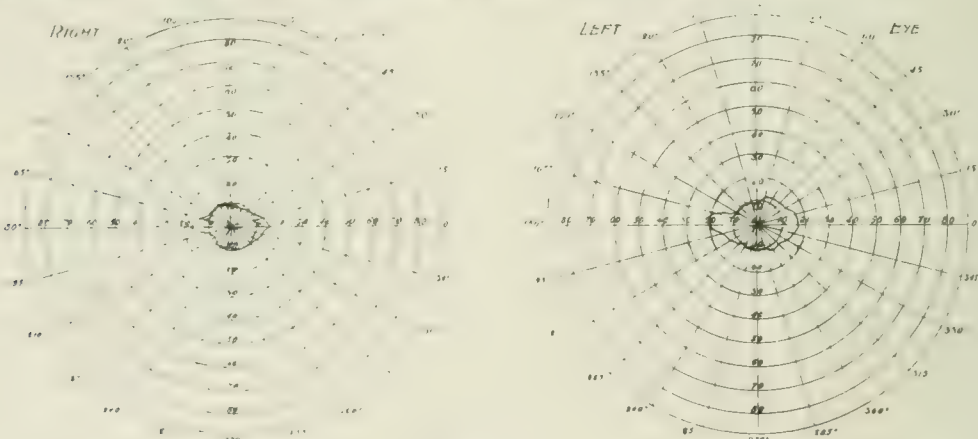
Dec 17th, VR $\frac{15}{25}$ L $\frac{15}{16}$ and fields as shown in the cuts.

Fig. 2.

Dec. 17th, 1896. After 31 days.

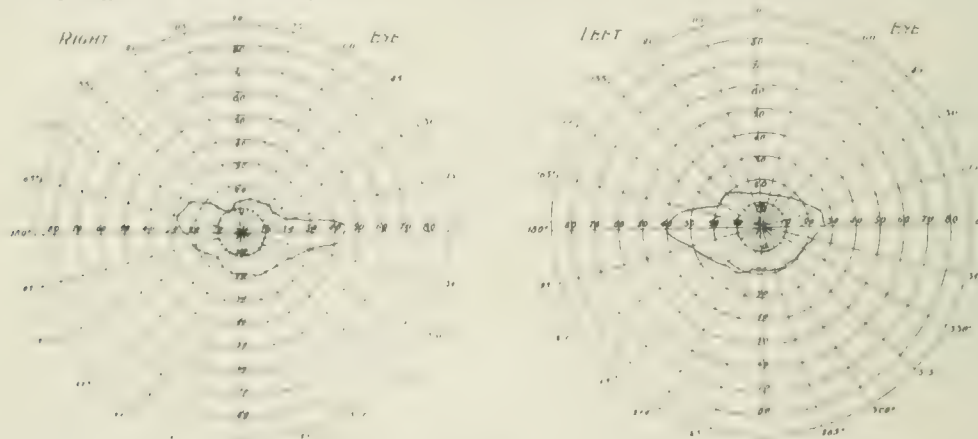
January 6th 1897, VR $\frac{15}{24}$ and L $\frac{15}{16}$. Color sense was limited to the very center. He read Jaeger No. 1 readily and his field had greatly improved.

Fig. 3.

Jany. 6th, 1897. After 50 days.

The strychnine was not well borne and was not continued after the first week. He complained several times of pain in the epigastrium and had one or two attacks of nausea, but I would say that except for the eyes he has been in about his normal condition since the second day after taking the quinine.

There is plenty of literature on the subject of amblyopia from large doses of quinine, but I find so many physicians unaware of the existence of such a thing that I think such a very typical case with the characteristic and slowly improving fields of vision is worthy of record.

I may add that a visit to the drug store referred to disclosed a number of bottles of quinine of the kind described in a location convenient for appropriation by such customers.

NOTE ON THE USE AND NON-USE OF THE OCCLUSIVE BANDAGE IN CASES OF HETEROPHORIA.

BY F. W. MARLOW, M. D.

Of Syracuse, N. Y.

Professor of Ophthalmology in the College of Medicine of Syracuse University.

(A) The onset of convergent strabismus during the wearing of a bandage for injury or disease in childhood, or during any affection which temporarily prevents binocular vision, is not uncommonly observed. A considerable increase in the degree of the heterophoria, and more especially an increased interval, between the induced double images is often observed when a bandage has been worn for two or three days after a tenotomy which, at the time of operation, apparently corrected nearly the whole manifest error. From a consideration of these two facts it would seem probable that (the annulling of the binocular function by) the total exclusion of one eye from vision for a few days would be likely to render manifest any latent heterophoria present. The following case lends strong support to the idea, and also shows how completely spasm of the extrinsic muscles may obliterate all trace of heterophoria.

G. W. S. Age 35 years. Some years ago suffered from asthenopia and occasional diplopia, for which he was treated by Dr. George T. Stevens, who exercised the muscles and ordered glasses correcting refractive error. Diplopia ceased. Recently he burned the eye lids of the right eye with molten iron, necessitating the closing of the eye with a bandage for a week. At the end of that time, I examined the condition of his refractive and muscular equilibrium, as he was again complaining of some asthenopic symptoms. I found R. hyperphoria 1° to 2°, exophoria 5° to 6°. The bandage was discontinued. He had noticed, on

removing it to dress the eyes, occasional diplopia, and remarked that he thought his old symptoms were coming back again.

I examined again seven days later, and found no muscular error whatever. The rod test and red glass, Steven's phorometer, and the parallax test showed orthophoria. 1° pr. placed in any direction destroyed the orthophoric condition.

Was this a case of heterophoria, or were the errors of equilibrium present after the week's exclusion, temporary conditions due to the pressure (light) of the bandage?

Taking into consideration the previous history, it seems most probable that the former explanation is the true one. The occurrence strongly suggests the value of the systematic use of the bandage to unmask latent heterophoria, and the case shows how completely heterophoria may remain latent in the presence of the ordinary tests. I have used this method in a few cases in which the symptoms seem to indicate the existence of a latent error where none could be detected by the ordinary tests. The following case is in point:—

E. S. G Age 25 years. Subject to severe sick headaches and asthenopia. At first, greatly relieved by the correction of his hypermetropic astigmatism; symptoms finally, however, returning. Examination showed the refractive correction to be accurate, and the equilibrium to be normal.

All other tests having failed to reveal any error of equilibrium and as there was no doubt of the connection between the symptoms and the use of the eyes I excluded the left eye by ground glass for three days, at the end of which time a left hyperphoria of one degree was disclosed, shown both by the rod test and by Steven's phorometer. A prism of one degree, with its base down for the right eye, produced diplopia, whereas it required a prism of three degrees with its base down before the left eye to produce diplopia. An hour later, both eyes having been used, hyperphoria of one-half degree still showed, and a prism of one-half degree with its base up was incorporated with the right lens. Previous to this time he was practically unable to read. This was in January, 1894. In April, he reported himself very much improved, having had very little headache, some discomfort after reading in the evening, but able to read for two or three hours. He now showed more hyperphoria, and the strength of the prism was increased.

This method of rendering manifest a latent deviating tendency is of course only a more thorough application of the principle underlying all the equilibrium tests, more particularly being a prolongation in time of the old cover test, the most reliable, with its suggestive complement, the parallax test, of all methods at present in use.

(B.) In the June, 1887, number of the *Archives of Ophthalmology*, Dr. George T. Stevens protests against the use of the bandage in ophthalmic surgery as being not only "needless but mischievous" and "as the promoter of heat, filth and septicism." He makes no reference, however, to the influence of the use or non-use of the bandage

upon the effect of the tenotomy. I am inclined to attribute great importance to the immediate influence of the binocular functions in establishing a perfect equilibrium after tenotomy while the tendon is more or less completely detached from the eye ball. This function compels the eye to occupy the position in which single vision is possible, and thereby helps to determine the point at which reattachment of the tendon shall take place. If, on the other hand, the eye is bandaged, it assumes its position of rest, there is no tension or straining of the tendinous fibres induced by the desire for binocular single vision, and the reattachment may take place at a point by no means the most favorable for that purpose. The following case illustrates this point:—

Case I. Mr. B. L. D. Aged 25. Medical student, for five years past the subject of headache and asthenopia, in spite of a very accurate correction of a moderately high degree of myopia and astigmatism.

Three or four years ago was operated upon for a very low degree of left hyperphoria ($1\frac{1}{4}^{\circ}$), without relief to his symptoms. In April 1896, there was L. hyperphoria $1\frac{1}{2}^{\circ}$, which increased to 2° after wearing a prism for three days. A prismatic effect= $1\frac{1}{2}^{\circ}$ was introduced into his glasses, making him decidedly more comfortable, but a little later he showed an exophoria of 11° ; the abduction being 16° , adduction 20° . Systematic exercise soon brought adduction to $48^{\circ}+$, leaving abd: 10° — 11° and exophoria 6° — 7° —but gave no relief from his symptoms.

He was now showing more hyperphoria, and finally nearly four degrees became manifest.

On November 14th I made a partial division of the left superior rectus tendon, leaving left hyperphoria= 1° . *No bandage was applied.*

Nov. 15th L. hyperphoria= $1\frac{1}{2}^{\circ}$

„ 16th R. hyperphoria= $1\frac{1}{4}^{\circ}$

Dec. 3rd No hyperphoria.

Tenotomies of both externi have been performed, and equilibrium tests now show orthophoria.

There has been a great improvement in his condition and he is now able to wear with comfort a full correction of his refractive errors for near work, which hitherto he had been unable to do.

Case II. Miss S. O. Aged 22. First came under observation 5 years ago, when no hyperphoria could be detected. Examination in Aug. '96 showed R. hyperphoria 10° . She was suffering from headaches and asthenopia and unable on that account to continue her college course. Her refraction had been and remained accurately corrected by glasses worn constantly for years past.

On Sep. 14, the Right superior rectus was partially divided, leaving Right hyperphoria= 6° barely. No bandage was applied.

Sep. 23. R. hyperphoria= 5° .

Partial tenotomy of L. inferior rectus, leaving R. hyperphoria of barely 1° . Left open.

Sep. 28. No hyperphoria

There has been no return of the hyperphoria, and the patient can now read for several hours a day, although there remains a low degree of Esophoria, with sub-normal adduction and abduction.

I have reported these cases very briefly, giving only the facts bearing on the subject of the paper.

TOBACCO AMBLYOPIA IN A WOMAN, WITH ANOMALOUS SCOTOMAS.

By G. E. de SCHWEINITZ, M.D.

Professor of Ophthalmology in the Jefferson Medical College, Philadelphia.

ILLUSTRATED.

The following case is reported chiefly because of the somewhat unusual shape of the scotoma which was the distinguishing characteristic of the affection, and also because the clinical history indicates that the relation of alcohol to the development of the central amblyopia is practically eliminated as an etiological factor.

A married woman, aged 60, in good circumstances, of large frame and healthy color, presented herself on the 25th of November, 1896, with the following statement: Since June, 1896, vision has been slowly failing, and since July she has been unable to read. This loss of vision had been unaccompanied by pain or any external manifestation of ocular trouble.

Her history, obtained partly by questioning and partly from a letter written by her physician, Dr. J. Cardeen Cooper, is as follows, I quote his exact words: "The patient has always disobeyed the laws of health and has always been subject to excessive tax upon her nervous system: great mental anxiety, loss of sleep, late hours and irregular meals. Four years ago she suffered from enlargement of the liver, disturbed portal circulation and chronic bronchitis. This illness was followed by general neurasthenia and much indigestion. At this period of her history the urine contained, from time to time, traces of albumin and sugar. Under treatment these symptoms entirely subsided and specimens of urine recently examined were normal."

The patient is rheumatic in the vague sense in which this term is used, but has not been subject to inflammatory rheumatism. There is no history of severe illness other than the one detailed in Dr. Cooper's letter.

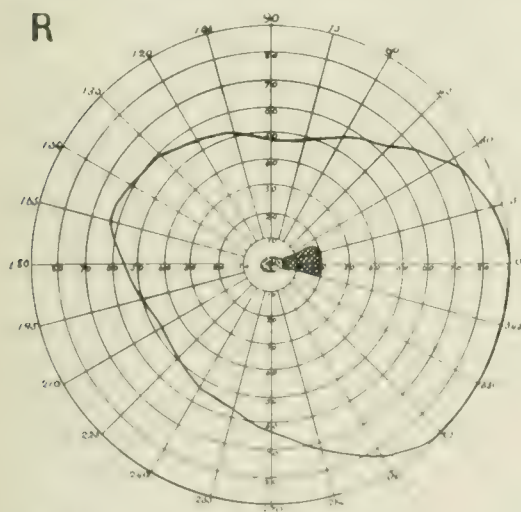
When 45 years of age, or 15 years before she sought advice, the patient began to smoke, at first only a few cigars a day, but for some years she has averaged at least six cigars during the twenty four hours, many of them being smoked late at night and during hours when she should have been asleep. It is probable that the use of the tobacco has been even greater than these words imply, as her daughter freely testified that she doubted if her mother had any idea how many cigars she smoked. The patient began to smoke to relieve, as she supposed it would, high tension of the nervous system brought on by insomnia, worry and domestic difficulties.

She does not use spirits in any form, is not an excessive tea drinker and takes no drug of any kind except digitalis, which has been prescribed in medicinal doses on account of a weak heart.

Vision in O. D. with $+1\text{ D} = \frac{6}{12}$; with $+4\text{ D}$ added, $\text{D} = 0.75$ is read at 22 cm. with difficulty; no range. O. S. V. with $+3\text{ D} = \frac{6}{20}$; with $+4\text{ D}$. added no ordinary print could be deciphered. The vision of this left eye has always been defective,—a defective sight associated either with some congenital amblyopia or arising from disuse in connection with high refractive error.

In the right eye the ophthalmoscope revealed faint haze in the lens periphery, a vertically oval disc with broadened scleral ring below and outward, a slight pallor of the outer quadrant of the nerve-head, arteries about normal in size, and veins somewhat distended and tortuous. In the left eye the lens was clear, the disc round, the scleral ring broadened inward, the central lymph sheaths full, the veins tortuous, the arteries normal and the lower and outer quadrant of the papilla slightly paler than its general surface. The macular regions were normal.

The peripheral fields were intact, but in the centre of each field there was a color scotoma for red and green as follows: It begins at five degrees to the temporal side of the fixing point, passes to 20 degrees on the horizontal meridian and to the same distance 15 degrees above and below this position (double cross-hatching in diagrams). In the space between 5 degrees to the temporal side of the fixing point and its nasal edge, the perception of color, red and green, is not lost but is duller than it is as compared with any spot within the area of normal color perception in the general field (dotted area in diagrams). These defects are almost exactly symmetrical, the scotoma being slightly broader on the right side than on the left. The area of the normal blind spot within each scotoma is recognized when examined with a small test-object. The scotomas were mapped with colored circles 1 and 2 mm. in diameter on a dead black surface.



Colors appear faded.
Scotoma red-green blind area.
Test-object 2 in m circle.

Fig. 1.

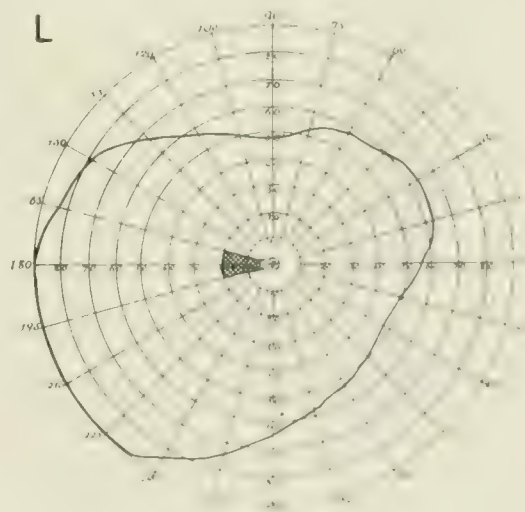


Fig. 2.

The patient was advised to discontinue tobacco absolutely, and to take strychnine and iodide of potassium. These directions were faithfully followed, and at the end of a month she reported with the vision of the right eye $\frac{6}{6}$ and ability to read 0.50 print. The area of red-green blindness previously described could not be detected even with the test-object only 1 mm. in diameter. The fog in the

center of the field of vision which had so annoyed her had practically disappeared. Ophthalmoscopic appearances seem to be unchanged. In the left eye the vision was as previously reported and the scotoma somewhat different in shape but still demonstrable. It begins outward and above at 5 degrees to the temporal side of the fixing point, passing then to 20 degrees. There is no scotomatous area below the horizontal meridian.

REMARKS.—Tobacco amblyopia is much more frequent in males than in females, not because the former are more predisposed, but because they are more exposed to the influence of tobacco. Indeed, Hill-Griffith is no doubt correct when he says that more cases would be found among women if the investigations of central visual defects were more frequently made, especially if search for color scotomata were more common. He records fourteen cases of toxic amblyopia in women. Berry has noted a number of instances and numerous others have been reported. This is the second case in my own experience in which I feel sure that tobacco was the prime etiological factor.

The typical scotoma in intoxication-amblyopia, according to my own measurements which closely agree with those of Sachs, is an oval with its pointed end towards the blind spot and its blunt end towards the fixing spot, to the nasal side of which it passes only slightly. The average measurements are outward 18 degrees, inward 3 degrees, upward 7 degrees and downward 6 degrees. This scotoma represents a red-green-blind area and commonly the extent of green blindness is greater than that of red, which in its turn may be surrounded by an area of imperfect color-sense. The "culmination spot," or "nuclear spot," in the language of Sachs, of the scotoma, lies horizontally from 1 degree to 8 degrees in a lateral direction from the fixing point, its breadth, vertically, being mostly below the horizontal line. Sometimes a small, easily over-looked scotoma exactly over the fixing spot is the beginning of the trouble. According to Groenouw's observations the typical egg-shaped scotoma results from the union of the scotoma from the fixing spot with a supplemental scotoma around the blind spot. The process may cease at this point or there may be progression characterized by an increase in the size of the color defect, usually above, until it meets the limit of the red field, that is the scotoma "breaks through," and if this goes on, the patient may eventually resemble a congenitally color blind person. In severe cases scotomas for blue and yellow form in similar manner to the red-green scotomas, and occasionally, especially in neglected cases, absolute defects are found within the relative area, and sometimes the entire

scotoma becomes absolute, although probably rarely in perfectly pure tobacco cases. Instead of the typical egg-shaped or oval scotoma the visual defect may pass up and out or down and out, or may be circular, or assume other shapes.¹

In the present instance the indications are that there has been an anomalous development of the scotoma, either because the process in the macular fibres of the optic nerve has not followed the usual course, or else, which is not improbable, because the scotomatous process began around the natural blind spot and did not reach the fixing point, or, rather, that the union which Groenouw describes of the central scotoma and the supplemental scotoma did not take place owing to the failure of the perfect development of the former of these phenomena.

This type of scotoma is of some clinical importance, inasmuch as our ordinarily received ideas of the pathology of intoxication amblyopia, namely, that it represents a lesion in the papillo-macular tract which consists of an augmentation of nuclei, an hypertrophy of connective tissue and a wasting of nerve fibres, has recently been called in question by Nuel, who contends that the central toxic scotoma is not primarily a neuritis of the macular bundle but a disease of the macula lutea, causing degeneration of its cells, and that the optic nerve changes are secondary to the destruction of the nerve cells of the macula. In this connection it will be remembered that more than twenty years ago Schoen expressed the opinion (I quote from Sachs) "that the scotoma seemed to be the functional expression of the already great physiological weakness of the centre of the retina, heightened by chronic intoxication, to which condition were added certain physiological peculiarities affecting the sense of color, due to the pigmentation of the central retinal spot. In ancient cases, however, owing to continuous strain and abnormal mixture of the blood, certain material changes of the macula lutea might result, which would lead to ascending atrophy, marked by a change of color in the lateral half of the optic nerve."

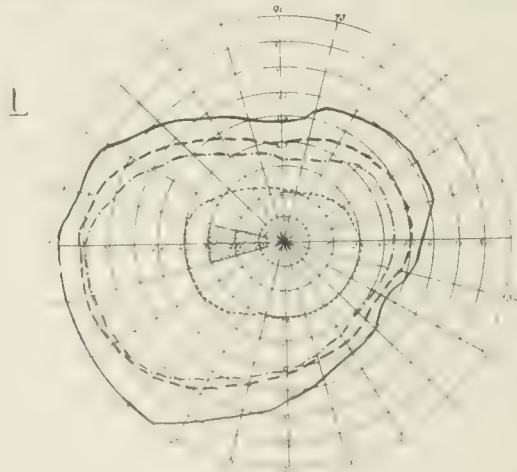
If the scotoma is due to macular changes it would seem, as Sachs has pointed out, that its relation to the vertical line should be symmetrical. This we know it is not. If the case which I report is to be classed as a tobacco amblyopia, and I think that it fairly may be so regarded, macular changes could hardly explain the present scotoma, which, indeed, so far as the red-green-blind area is concerned

(1) See paper by the writer, *Journal American Medical Association*, Oct. 1900.

is displaced from that portion of the visual field which represents the macula.

There is, however, much to be said in favor of the macular origin of the central scotoma of tobacco amblyopia, both from the clinical and the experimental side. We know that destruction of the area of the macula by a coloboma, or by a patch of central retino-choroiditis, is followed by quadrant atrophy of the optic nerve. We know, too, that in a fair proportion of tobacco cases fine macular changes are demonstrable with the ophthalmoscope. These have been described by Nettleship, by Hill-Griffith, by myself and by other authors, although I confess that it never occurred to me that they had aught to do with the scotoma. Nettleship also regarded them only as coincidences. Experimentally, macular-fibre degeneration can be produced by properly placed retinal lesions, for example, by destroying the area of the retina between the macula and the optic entrance with the galvano-cautery and subsequently observing degeneration in the optic nerve fibres. A research of this character has recently been published by Usher and Dean.

Finally, I would call attention to an interesting point in connection with this case, namely, that one eye was congenitally deficient in visual acuity, representing that type which has sometimes been described as a "neglected eye." Now in this class of cases, in addition to the ordinary defective vision as measured with test-types, central scotomas are occasionally found, or at least, areas of central



Scotoma in an amblyopic eye
with high refractive error.

Fig. 3.

depreciation of color sense.¹ In a certain number of them the sco-

¹ See paper by the writer in the *Annals of Ophthalmology and Otology*, Vol IV, No. 2, July, 1905.

toma, instead of being centrally placed, has a situation between 5 and 30 degrees to the temporal side of the fixing spot, as represented in the accompanying diagram,—a scotoma closely resembling the one which I report. Whether in the present instance there was a preexisting area of defective color-sense, which was intensified by tobacco poisoning and therefore retained its original shape, is a matter of pure speculation. It would seem, however, as the defect is symmetrical, and that the right eye, which was the seeing eye, is affected exactly as is the left which was the partially amblyopic eye, that not much information is to be gained from this point of view. Evidently the whole question of the formation of scotomas in toxic amblyopia is unsettled. We are not even sure that a perfectly pure tobacco case exists in the sense that there is no other etiological factor except tobacco. Therefore the record of each new case, with variations in the scotoma, is desirable. Much more to be desired is a continuation of the experimental work connected with this question. On this point I shall have more to say in a subsequent communication.

ADVANCEMENT PREFERABLE TO SIMPLE TENOTOMY.

BY **H. Mc I. MORTON, M. S., M. D.**
Minneapolis, Minnesota.

It is my belief that of all the cases of strabismus which present themselves to us for treatment, there are few in which an advancement operation is not preferable to the more common procedure of simple tenotomy without advancement. The latter, requiring less skill, less time and being less exacting to both patient and operator is given preference, and the former, even when performed, is unfortunately too often an advancement in name alone. It has been my observation that this operation is done more indifferently, in this country, as well as abroad, than any other ophthalmic operation. This is in all probability due to the fact that from all of the great number of different operations proposed, there has been no general adoption of the very few that are worthy of the honor.

We have come to think of one way to do a cataract extraction or an iridectomy, with possibly slight modifications to suit the taste of the individual operator, but the number of advancement operations proposed and executed is legion.

If we hope to attain to success in the advancement of an ocular tendon, we must never fail to have before us some cardinal principles

to be applied, even though the methods of applying them may differ slightly.

In the first place it is an unwise practice to be misled by methods of "Capsular advancement" or "Conjunctival advancement". We are to advance *the tendon* if we are to obtain a permanent, as well as immediate result. Then let us not deceive ourselves by thinking we can get good results when we attach our sutures to the conjunctiva or subconjunctival tissue, for we but build on the sand and our house is soon destroyed. We must fix the tendon to the new point by sutures imbedded *in the sclera*. It will then remain anchored where we have placed it. Again, our sutures must not be frail, but of good strong silk or light catgut that will hold firmly, and, lastly, it is better to err in permitting the sutures to remain in too long or altogether than to hastily remove them. In advancing an ocular muscle we get just what effect we desire, and in case of a slight over-correction the eyes will readjust themselves, while in doing simple tenotomy it is well known that an "over effect is much to be feared" and if such an accident happens the eye will not commonly correct the effect of the error of judgment in the operator. It is manifest also that the innervational balance of the muscles is impaired or destroyed in displacing a tendon backwards, and the power of rotation in that direction diminished. By simply testing the rotary power of a muscle that has been tenotomized and comparing it with the corresponding muscle which has not been operated upon, this fact becomes evident. It has been my practice for some time to correct even high degrees of heterotropia by advancement *and without* tenotomy of the antagonist. In cases of high degree it may be found necessary to excise a portion of the tendon we are advancing in order to obtain sufficient result. I have not yet found such a condition of organic contraction of the substance of the opposing muscle which demanded tenotomy of that muscle. Even in case of high degree of convergence of the visual axes the increased tension induced by advancing the externus has not discomfited the patient, and combined with excision affords the most perfect results. In case of marked strabismus it is preferable to *equally divide* the operation between the externi if we are dealing with a convergent squint.

If we look for cosmetic results alone, advancement affords more permanent results than simple tenotomy and preserves a more equal power of rotation in the corresponding muscle.

From the standpoint of obtaining parallel visual axes in order that we may establish binocular vision, the advancement operation is

the more rational and satisfactory, for by displacing a muscle backward we manifestly diminish the innervational tension and balance of the eyes, whereas in displacement forwards this balance is not destroyed, as the tension being increased the eyes readily readjust themselves. As stated, no better proof is needed than the different effect of the two operations upon the rotating power of the corresponding muscle. In this class of cases I proceed as follows. If the patient be quite young it is almost always necessary to administer a general anæsthetic and I always deem it a wise plan to obtain quite a little over-connection and use Prince's single suture method. We can then without much difficulty decrease the effect if we desire. If, after carefully dissecting out the tendon, we find it to be very small, I take a "tuck" in it as suggested by Valk & Savage. My reason for doing this is that I have obtained better results from this method when dealing with small, in some cases almost threadlike, tendons, than by advancement as usually understood. With these exceptions just noticed, I usually practice a method of advancement which I have adopted from Dr. Buller, and it more nearly fulfills the needs I have mentioned earlier in this article than any operation I have seen. An elliptical piece of redundant conjunctiva is excised over the insertion of the tendon, the tissue dissected aside about half an inch and the insertion exposed. The tendon is grasped by the advancement forceps and cut through at the insertion into the sclera; the stump is excised and the tissues dissected up to the corneal limbus. Both ends of a double needled suture are passed from the inside of the tendon outwards and tied in a knot, thus enclosing the central bundle of fibers of the tendon. An accessory suture is passed from within outwards near the lower edge of the tendon in a vertical line with the central suture and also one in the same line near its upper edge; these are not knotted to enclose the upper or lower bundles of the tendon. The two needles of the central suture are passed sufficiently deep into the sclera *near* the corneal margin to get a very firm hold and then drawn together until sufficient effect is desired and tied. The accessory sutures are passed likewise into the sclera above and below the central, not so deeply, and tied. I have found this method quite easy of application and very satisfactory in its results.

AN INTERESTING BUT DISASTROUS TERMINATION OF A CATARACT OPERATION.

BY DAVID H. COOVER, M. D.

Of Denver, Colorado.

As a rule only the successful results of cataract operations are reported; the unsuccessful ones lie hidden in the case books. There are many failures which if published would be interesting and more instructive than the brilliant results of which the operator is so hopeful after he has successfully delivered the lens and cleared the eye of all debris. He naturally places the bandage on with a sense of relief and feels that the result ought to be good. We are not always rewarded even in the most favorable cases.

On April 9, 1895, Mrs. B. aged 77 years consulted me for blindness. On examination found she had double cataract which were matured. On further questioning her found she had had diabetes for several years and was passing about a gallon of urine in the twenty-four hours. Her health was fair and she complained only of her blindness. The urine showed a large quantity of sugar. I searched all the literature at my command in reference to the results of operations upon diabetic cataracts and failed to find any unfavorable comments. As a precautionary measure the patient was placed under treatment for a month, and the quantity of urine was reduced to two quarts in the twenty-four hours. At the end of this period she appeared in good health and spirits and desired to have the operation performed.

I operated upon the right eye, taking every antiseptic precaution, made the modified peripheral linear incision, iridectomy, delivered the lens successfully, cleared the anterior chamber of the soft cortical mass, replaced the edges of the iris, cleansed the wound and conjunctiva, placed the eye pads in position over which a dark knit bandage was tied securely around the head, and then saw that she was placed comfortably in bed. The case progressed very favorably, no pain or discomfort being complained of; on the third day the eye was opened, the wound seemed secure, pupil clear; she saw my face and counted fingers; there was but little congestion. The eye was comfortable, and vision good until the afternoon of the sixth day, when suddenly a very acute and excruciating pain attacked the eye. I was called at once. On opening the eye found it slightly more reddened than in the morning; no more ciliary tenderness than one would expect after an operation; tension normal, anterior chamber clear, but not even light perception. Hypodermic of morphia was administered, and hot applications constantly applied without relief. The next morning pain was the same; to my horror I noticed the cornea hazy and edges of the incision were ragged, as disintegration had begun. The whole cornea became infiltrated and sloughed and the eye lost, pain was constant except when under a narcotic. On the morning of the fourth day after the eye became involved, she suddenly exclaimed to the nurse, "The pain has gone from my eye and now it is in my left wrist," it was just as severe as it had been in the eye. A few hours afterwards the finger nails became dark, skin over hand and fingers of a dusky hue and were cold. She was pulseless at the wrist, arm

cold above the elbow. Three days afterwards she went into a diabetic coma from which she never rallied; at the end of another week she died. At first there was some doubt in my mind as to the cause of the loss of vision and of the sudden onset of acute pain, but when the thrombus formed in the brachial artery of the left arm it became evident that the same had occurred in the central retinal artery of right eye.

I report this case for the following reasons:

FIRST, because it is instructive and interesting.

SECOND, that one cannot be too sanguine as to favorable results in operations upon diabetic cataracts, and

THIRD, that reducing the quantity of sugar does not lessen the risk in these cases, for I believe had I operated at once the eye would have recovered and had useful vision for at least a month before the crisis came and the operation would not have been assigned as the cause of death nor the operator censured by the friends.

TREATMENT OF STRABISMUS IN CHILDHOOD.

By C. M. HOBBS, M.D.

Iowa City, Ia.

There have been great differences of opinion amongst surgeons of repute, as to the propriety of early operation in cases of squint. Many believed that it was of advantage to operate early, even in infancy, while a few always deprecated early operations. In recent years the preponderance of opinion has been against operation until the age of six, and a considerable number postpone operation until after puberty. The consideration which has led to the opinion that operations in children should be deferred in cases which are able to remain for a long time under the surgeon's care and observation, are the results of prolonged experience with methods, which have been so entirely satisfactory, as to secure confidence in their application.

The objections to early operation should be carefully considered in each case, and if insurmountable they should prevail against the natural desire for immediate results. The parental anxiety to have the deformity removed as soon as possible, on the other hand, should be gratified if it can be done without jeopardizing the more important aim of the conscientious surgeon, which is to secure binocular vision, or common functional activity of both organs of vision.

The subject of amblyopia in squint has not yet received all the consideration it is entitled to: and it is not yet definitely settled

whether amblyopia of the squinting eye precedes the squint, or whether it is always the result of non-use of the squinting eye, or whether the truth may not lie between the two propositions.

It has been observed that squint sometimes becomes spontaneously cured at puberty, and this is certainly true as to the deformity, but in such cases, monocular vision prevails as a rule, and the squinting eye remains amblyopic. It has also been stated that cases of squint operated on in early childhood, are prone to develop divergence after puberty; and this is probably true in all cases in which binocular vision has not been obtained.

In the light of present knowledge, there can be no hesitation in accepting the doctrine that amblyopia results from non-use; and while it is not improbable that amblyopia sometimes precedes squint, and may even indirectly cause it, yet the vision of a squinting eye progressively deteriorates, unless the eye be employed in some visual effort.

The advantage of early operation in preventing amblyopia is more apparent than real; for unless the surgeon makes sure after the operation that the habit of monocular vision is overcome, the relief of the appearance of deformity takes from the parents the incentive to the constant efforts which alone can bring about binocular vision.

In those cases of alternating squint in which the vision is normal, or nearly so, in both eyes, early operation might of itself lead to binocular vision; but the difficulty in determining the acuteness of vision before six years of age makes it practically impossible to select these cases earlier; and in the writer's experience cases of alternating squint with equal or nearly equal vision of both eyes, are the most persistently monocular in their vision.

Donders' association of hyperopia in a causative relation to convergent squint is not accepted universally; and it seems probable that the theoretical adaptation of convex lenses to the squinting eyes of young children has often accentuated the monocular vision, and fostered the amblyopia.

Careful observation of cases extending over more than twenty years has led to the belief that the best results in converging strabismus of the young are to be obtained by subordinating the idea of "straightening cross eyes" to the systematic effort to secure binocular vision. The accomplishment of this object of treatment always carries with it the desired improvement in appearance, while the mere relief of the deformity may not be accompanied by increased usefulness of vision. For this functional result, it is better to postpone operation until it is

certain that success is impossible without tenotomy and consequent weakening of muscles. Excepting those cases in which the squinting eye is too amblyopic to fix any object, and in children under ten years of age binocular vision can be secured by persistent training, in nearly every case. The method employed is by no means new; it was employed with some success before ocular surgeons were familiar with errors of refraction, and long before the ophthalmoscope made a mystery of amblyopia. The opportunity we now have to remove some of the causes of monocular vision, enables us to employ these simple measures with much greater efficiency. When squint is discovered in infancy, the cause may sometimes be found by careful observation; and it may usually be determined whether the preference for monocular vision applies to all distances, or only to near objects; and whether the child always prefers to use one eye, or sometimes uses one and sometimes the other. If no cause for deficient vision be found with the ophthalmoscope, the child should at once be compelled to use both eyes, one at a time; and this applies to all ages up to ten or twelve, although the earlier the training begins the better. As the child extends its horizon the work put upon the defective eye should be increased, and the practice should be divided between near and distant use. The ordinary direction given, is, to bandage the better eye an hour in the forenoon and an hour in the afternoon, and give half the time to playthings and pictures and half to walking, rolling a ball etc. and when the vision is very defective, to finding the way around the room or yard, and to search for concealed objects. When the child has learned the letters and is fairly tractable, the acuteness of vision should be measured carefully and recorded for purposes of comparison. The refraction should now be corrected, giving especial care to any astigmatism. (In case of doubt the writer prefers to trust the ophthalmometer for axis and quantity, without deduction, and to wholly correct the hyperopia if any be present.) Frames should be carefully looked after, and should be made for use and ease and not for appearance. The compulsory use of the defective eye should be continued, and muscle training begun. The method of bringing the different muscles into action should be taught to some one who will be persistent in daily training the child, and the work should be continued from day to day without intermission.

The muscle training should be applied to both eyes, although the defective eye should usually receive the most attention. It should consist in causing the eye to which attention is given, the other being

covered, to make excursions in various directions, to the maximum possible, with the eye accommodated for different distances. Exactness of movement, and rapidity of action should be insisted upon.

For binocular vision it is essential that the following functions should be combined;—

Prompt mental interpretation of the retinal image in either eye.

Prompt and accurate direction of either eye.

Co-ordination of the movements of both eyes, so that they may be directed towards a common point.

More or less simultaneous mental assimilation of the retinal images of the two eyes.

It is easier to train the co-ordination when the muscles of each separately are under the control of the will, than when one is well practiced and the other neglected.

It is easier to secure co-ordination when the mind can appreciate each retinal image separately with some degree of promptness, than when one is quickly seen and appreciated and the other is unfamiliar.

It is easier to co-ordinate two sets of muscles, when both are well practised, than when one is practiced and the other is not.

The practice essential to co-ordination is more effective in early life than after maturity.

The method described will secure better vision and better muscular control, when employed in childhood, than can be obtained after operation without such practice; and in the small percentage of refractory cases a late operation accomplishes better visual results than can be secured without such early training.

NOTE.

A very good description of the method of treatment of Strabismus in use before tenotomy had been recognized by the profession as a proper resource, may be found in *Middlemore's Treatise of Diseases of the Eye*, London, 1835. Vol II. p. 563. The operation of strabismus, as rescued from traveling charlatans, came in vogue soon afterwards; the first operation reported in America being made in August 1840. Had tenotomy failed to come into use before the ophthalmoscope and accurate means of recognizing errors of refraction were known, it seems reasonable to suppose that the older methods of treatment would have been perfected, and the efforts of the surgeon would have been directed towards restoration of function rather than relief of deformity.

PENETRATING WOUNDS OF THE LENS. REPORT OF FOUR CASES.

BY H. BERT ELLIS, M. D.,
Of Los Angeles, California.

Case I. Master R. G., ten years old, came to my office on March 2nd, 1896, with an injured eye, and gave the following brief history. About five hours previously, while out flying his kite with other boys of about the same age, he had occasion to adjust the strings and tail of his kite. While tying a knot the kite slipped and the sharp end of the back bone ran into his right eye. The boy was frightened but as the injury did not cause him much pain he did not report the accident to his teacher for some half hour or more; and it was not till the boy began to complain, some two or three hours later, that he could not see very well with the injured eye, that a physician was sought, who referred the boy to me.

I found a corneal wound of the right eye $\frac{1}{3}$ in. long running obliquely, downwards and inwards about $\frac{1}{4}$ inch at its center, from the external sclero-corneal margin. The iris was caught in the opening, and the nasal or superior lip of the wound of the cornea bulged considerably; the pupil was small, irregular and non-responsive. The lens capsule had been punctured and the lens fibers were beginning to swell and the red reflex was only to be had on the nasal side of the pupil.

The lad had suffered no pain from the time of the accident, either in the eye or adjacent parts. I ordered a solution of sulphate of atropin, 4 grains to the ounce; a couple of drops every three hours.

In 24 hours the pupil was irregularly dilated, the iris partially pulled out of the corneal wound, and the lips of the wound were quite accurately adjusted, but the lens substance was so opaque that no reflex could be obtained and so swollen that it exuded through the capsular wound into the aqueous humor as a gray fluffy mass.

On account of the rapid swelling of the lens and increased tension I decided to open the anterior chamber and extract as much of the lens as possible; this was done on the sixth day after the accident. At the same time I detached the iris from the corneal wound. The boy made an uneventful recovery excepting a slight reattachment of the iris to the cornea.

Six weeks after the operation I fitted glasses to the little fellow and gave him vision of $\frac{4}{9}$ in the injured eye, by the use of a compound lens $+ 12 \text{ Sp } \subset + 2.50 \text{ Cy. ax. } 135^\circ$.

During the vacation while romping with older brothers, he had the misfortune to receive a severe blow on the same eye, which produced an iritis. As he was in an adjoining territory at a mining town, at the time of the second injury, he was not seen by me till quite recently, at which time I found the pupil occluded by a thin membrane which interfered with vision. An operation for the removal of this membrane will be performed during the Christmas vacation.

Case II. Mr. E. W. aged 25, blacksmith, consulted me April 20th, 1896, on account of an injury to his right eye. A week before while fooling with a percussion cap, it exploded, cut the cornea on the temporal side at the sclero-corneal margin, tore a hole through the iris at its attachment and punctured the capsule of the lens close to its external edge. The wound had caused some pain for which a druggist had given him a solution of cocain to use in his eye.

At our first meeting, I found the pupil evenly dilated excepting that portion close to the injury of the iris which was flattened. There was no inflammatory condition of the eye, the media were clear, the use of the ophthalmoscope revealed no portion of the cap within the eye, although I could find no counter-opening in the cornea and vision was but $\frac{6}{60}$ and could only be brought up to $\frac{6}{40}$. However the unwounded eye had vision of only $\frac{2}{60}$ and could not be developed to better than $\frac{6}{80}$. There were some cortical opacities running from the lens wound towards the center but not invading the pupillary space to any great extent. Tension was normal. I saw the patient again on the 1st of June, the cataract had not increased any and vision had improved to $\frac{6}{40}$ without a lens, but could not be increased beyond that with any combination of lenses.

This case was peculiar from the fact that the cause of the injury was known, a piece of a copper cap had cut through the cornea, had torn a hole in the iris, and had gone with sufficient force against the lens to start a cataract, yet no sign of this piece of copper could be found in the eye, nor was there any symptom present indicating its presence, and no track of exit was visible with the most careful search. I was convinced at the time that a small piece of copper must be hidden within the eye, but deemed it my duty not to search for it with other instrument than my eye as long as no inflammatory symptoms existed.

Case III. Miss A. V. P. aged three years, came to me September 8th, 1896. Her father, who accompanied her, said that three weeks previously her right eye had been scratched by the sharp end of a freshly cut pepper branch, and according to his statement the eye (i. e. the cornea) had been blistered by the sap, which had left a white spot. For a week the lids had been much swollen and especially so at night.

The little girl herself said that she had cut her eye with the knife when attempting to cut the pepper branch from the tree.

An examination of the eye, showed that the child's claim was probably correct. I found the line of the corneal cut running from above downwards and outwards nearly the whole length of the cornea just at the outer edge of the pupil with an anterior synechia at that point. The instillation of a few drops of a 1 per cent solution of the sulphate of atropin, dilated the pupil in half an hour. It was not quite circular. The lens showed opacity shading off from point of wound, with but little reflex, even at the periphery. Quite an acute conjunctivitis and blepharitis existed which I treated by ordinary methods and which quickly yielded.

On September 16th, 1896, I made a second careful examination and found the cataract so well developed that I could get no reflex and the child could only detect forms. October 3rd, 1896, I again saw the child but found no particular change in the condition of the eye. The corneal scar was very white.

Case IV. E. G. S. aged 26, laborer, consulted me October 30th about his left eye, which was very much inflamed, and was giving him no small amount of pain. On the 29th while blasting rock he was struck in the eye by a flying stone, hurled by a premature explosion. The pain at the time of the accident was

considerable, but it had been increasing up to the time of the consultation. I found a ragged Y shaped wound of the cornea, with the adjacent corneal tissue somewhat opaque. The pupil small, and iris muddy, lens opaque with part of its substance as a fluffy mass in the anterior chamber. The peri-corneal injection was very marked.

I advised immediate enucleation but the patient begged that something else be tried first and that removal be the last resort. I accordingly put the eye under the influence of atropin and on the following day removed as much of the lens as possible. The operation was of no further benefit than the giving relief from pain for a few days. Inflammation soon became more marked and enucleation had to be resorted to November 29th.

These cases represent a few of the many phases of lens accidents. No hard and fast rules can be laid down for the treatment of these injuries. Each case must be watched and treated according to its individual needs.

CLINICAL NOTES.

By Wm. E. BAXTER, M.D.

Ophthalmic Surgeon to the Boston Dispensary.

Foreign Body in the Canaliculus. Reading Dr. Taylor's case of foreign body in the canaliculus reminds me of a case of a similar nature seen in the service of Mr. Lang at Moorefields; a patient presented himself complaining of intense conjunctival irritation. On inspection the conjunctiva near the inner canthus was found to be much abraded, and closer inspection showed a stiff bristly hair protruding from the upper canaliculus. This was removed by means of forceps; the patient stated that several days before, while having his beard trimmed a piece of hair fell into his eye, and that the trouble came on at once. In this case also the hair must have been thrown directly into the punctum.

Prescribing Atropia in Old People.—Concerning Dr. Brown's case of glaucoma following the use of atropin, I cannot think why one should ever wish to use atropin for refractive purposes in a patient of sixty years of age, as the accommodation is sufficiently relaxed at least one or two decades before that age to render such practice unnecessary. The possibility of glaucoma following the use of atropin in patients over fifty years of age is sufficiently great to make one hesitate as to using atropin for therapeutic purposes in these patients, to say nothing as to using it to paralyze an accommodation already relaxed by age.

CORRESPONDENCE.

PASADENA, CALIFORNIA, January 31, '97.

TO THE EDITORS OF THE OPHTHALMIC RECORD.

Dear Sirs;

A few days ago I received the January number of the Ophthalmic Record in which Dr. Gould publishes a cut of an instrument which he calls a "Sulcus Syringe." In the N. Y. Med. Journal in Sept. or Oct. 1885, I published a cut of the identical instrument, which I had devised for the same purpose as that for which Dr. Gould's instrument is intended. Dr. Gould no doubt has had the same idea as many others have had, but you will pardon me for calling your attention to the circumstance.

Sincerely yours,

JOSEPH A. ANDREWS.

REVIEWS.

Study of an epidemic of Acute Purulent Ophthalmia and of its Cause--the Bacillus Septatus. By Dr. Th. Gelpke. (*Gräfe's Archiv für Ophthalmologie*, xlii, 1896, page 97.) Recently Dr. Gelpke had the opportunity to observe and study bacteriologically an epidemic of acute conjunctivitis which affected a large proportion of the inhabitants of two small villages in the vicinity of Carlsruhe. The onset was rapid, it spread quickly from house to house, and frequently entire families were affected. In all were noticed the same symptoms: headache, malaise, fever, loss of appetite, redness and swelling of the lids, so that after ten hours they could be no longer opened spontaneously. Upon separating them there immediately welled up a copious secretion, at first thin and later muco-purulent. There were great photophobia and pain. Upon everting the lids, the fold of transmission protruded, being enormously swollen and of a peculiarly dark red color, containing many small extravasations and covered with a fibrinous membrane. Later the surface became rough from an enlargement of the papillae and ultimately became wrinkled from an active follicular process. As the eye-ball became involved, a punctate parenchymatous infiltration of the margin of the cornea was noticed, together with irritation of the iris and miosis. Hence the condition is diagnosed as *conjunctivitis contagiosa epidemica* (Arlt) s. Schwellungskatarrh. The hygienic conditions were very bad, the summer was hot and dry and the dust lay on the more frequented roads ankle deep, while the water supply was wholly inadequate. Tuberculosis and scrofula were prevalent in both places, and individuals who had been treated for these constitutional conditions were rather more apt to be affected. The duration of the average case was from eight to fourteen days, while the severer, with perhaps corneal complications, demanded at least a month of active treatment. After regulating as far as possible the daily routine, a 1-5000 solution of sublimate was frequently and thoroughly used as a lotion, then when the acute symptoms had somewhat subsided, a 1-500 solution was vigorously rubbed into the conjunctiva of the everted lid, with especially gratifying results in those cases which were characterized by the papillomatous proliferation; this caused pain even with cocain. Corneal and iris complications were met as they occurred. The results were excellent. The bacteriological investigation was carried

on in conjunction with Prof. Migula, the material being derived from children under the care of the author and who had become infected by a child who had recently passed through the epidemic.

To obtain a knowledge of the micro-organisms commonly met with in the healthy conjunctival sac, a series of experiments were first of all instituted upon:

1st, the ordinary run of office patients who come for other than eye troubles, thirty in number;

2nd, a similiar number of college students and intimate friends;

3rd, a similiar number of ladies and maidens of the higher classes;

Careful examination gave differences in appearance, but none had conjunctivitis. The inoculations were made upon bouillon-peptone, and agar with glycerine 1% and kept three days at a temperature of 37° C. In the first series 63% were sterile; and in the second 83%, and in the third 100%. This suggests the possibility that all strictly normal conjunctivae are sterile; the variations of different authors being probably due to contaminations from the edges of the lids. Then the behaviour of the secretion of the little patients upon the different culture media, consisting of blood serum and peptone-agar at first, and later peptone-agar with glycerine 1%, is described in detail.

Pure cultures of the same bacillus as that present in the secretion from the children were also obtained from the secretion of twenty-six individuals who had later in the epidemic suffered with this acute conjunctival inflammation, and the constant appearance of this bacillus naturally justified the opinion that it must have a specific connection with this conjunctival inflammation and suggested more extended biologic and morphologic study.

This organism, when examined in the 'hanging drop' at an early stage, appears as a short rod, slightly pointed at the ends, non-motile, length 1 m , breadth $\frac{1}{3}$ - $\frac{1}{4}$ of the length. At first glance its very remarkable characteristic meets the observer, which is a clear zone, by which the impression is awakened that he is examining two short rods with the ends in contact with one another. On more careful examination he sees before him one cell-body through whose centre transversely a bright space passes, which becomes still more evident if the bacilli are looked at after staining, which is easily accomplished by the usual analin colors or by the method of Gram, and when they are well stained it will be seen that the contour is in no place interrupted nor is a constriction noticed in the region of the zone. In

pure cultures, one day old, are bacilli with the characteristic bright zone, the plasma-space; great variations in the dimensions of the bacillus are apparent. Preparations made from cultures resulting from direct inoculation with the conjunctival secretion, they being relatively recent, display bacilli which are short and slender, while those bacilli derived from repeated re-inoculation at the same stage are coarser. These differences are probably due to the fact that the older cultures had become accustomed to the artificial conditions and therefore grew more luxuriantly. Different culture media affect the appearance of the bacilli, they being slender and long when grown upon blood serum and short and thick when upon glycerine-agar, and still more startling are the differences according as certain conditions (moisture, alkalescence, etc.) vary. If the bacillus, for example, has been planted upon glycerine-agar which was more or less dry and rather old the growth is less luxuriant than in a fresher agar-tube or one to which there has been more glycerine added. The involution-forms begin at a time when the culture medium is with the point of being exhausted, and this is, relatively early, the case in the conjunctival secretion and unsuitable media. If preparations are made directly from acute conjunctival inflammations, degenerated bacilli are almost exclusively present. If bacilli of the same age (two days), grown upon moist and dry agar, are compared, the bacilli derived from the moist resemble the youthful forms while the others appear as one of the involution forms; the length has now doubled, the ends have become blunt, so they appear more parallelogramatic, and instead of there being one space, there are several. The author is not able to satisfy himself whether the lack of moisture is a determining cause as regards the differences in their appearance. Clinically it was noticed that the spread of the epidemic was most rapid at the time when the heat and dryness were the greatest. Doubtless dryness plays an important role with this as with other organisms and no doubt other factors (toxins) exert a detrimental influence. On the fourth day the bacilli from the agar cultures had taken on a slight nodular swelling of the ends by which they assumed a dumb-bell form. Blood serum cultures of the same age are slender, poorly developed, and do not have the nodular ends. The single or multiple plasma-space is not wanting. During its further development, the bacillus increases in length and number of segments, and takes on changes in form quite rapidly. While dry media bring the growth to a climax in five or six days, more favorable conditions prolong it

ten or twelve days. As regards the final stages of the involution, some of the bacilli retain the form of the parallelogram, with others the dumb-bell prevails while enormous swelling of the ends is seen giving the bacillus the form of a club. Other differences are noted which are not due to age or different nutrient media. In their final stage sometimes a swelling and splitting of individual segments occur, in which a space parallel to the long axis appears by which the suspicion of a new, short, bacillus-formation is aroused. Just as singular is the falling apart of the entire bacillus into angular or round plates which collect in the water of condensation. As a residuum of the bacillus there remains an empty tube. There has been noticed in the early degenerative stages around the bacillus a colorless zone, which to Friedlander's Capsule stain took on a pale blue tint, yet this must not be considered as final because most bacilli have on their surface something which by certain staining methods and treatment can be made visible.

This bacillus is aerobic and thrives upon agar-agar, glycerine-agar, blood serum, grape sugar-agar and neutral bouillon. Temperature limits are 30° – 42° but most favorable 35° – 37° . It does not grow on gelatine or potato, and needs slight alkalinity and moisture. Agar with 1% glycerine is preferred by the Author. Glycerine-agar 6% gives a scanty, non-characteristic diffuse growth. Stabs in grape sugar-agar give minute colonies along the stab without fermentation. Pure colonies on sterilized milk coagulate the casein with alkaline reaction. On neutral bouillon in 24 hours small yellow flocculent masses form a sediment, the bouillon remaining clear if there is no contamination. On 1% glycerine-agar in from 12 to 24 hours appear minute, distinct, grayish white, well defined clusters which double in size during the next 24 hours, and remaining within the inoculation limits. Reinoculation on moist agar or 5% glycerine-agar after 12 hours produces many minute, punctate, always sharply limited colonies. These colonies grow as well upon dry as upon moist culture media only not so luxuriantly. A yellow flocculent sediment made up of dead bacteria and involution-forms is noticed in the water of condensation after the third day. During the systematic reinoculation every fourth or fifth day the bacilli were observed to increase in length and in number of segments through spaces appearing in the plasma, and in old cultures the degenerated bacilli seemed to be disintegrated into forms resembling cocci, but by carrying this form over to a fresh tube he could positively identify young forms which had sprung from the same.

These facts would have been convincing enough to prove the propagation by segmentation if careful investigations had not demonstrated in the bacillus simultaneous alterations which suggested the possibility of another method of propagation, spore formation. The localized enlargement and the active staining qualities of single segments of the transformed bacilli suggest this possibility. To decide whether there was actual endogenous spore formation, three methods of investigation were undertaken:—

1st, by the hanging drop.

2d, by staining methods applicable to spores (Neisser and Ernst).

3d, observing the vitality of the bacilli.

The first is exceedingly convenient in recognizing a possible spore, for the highly refractive properties of the spore would never be mistaken for the alternating light and dark areas representing the segments and spaces of the bacillus. At first the staining methods seem to favor spore formation.

In the bacilli stained according to the methods of Neisser or Ernst there can be detected in the lightly stained bacillus certain segments which accept the color in an especial manner. There appear isolated granules colored distinctly red lying sometimes in the middle sometimes at the end of the bacillus, which is usually smaller than an individual segment and not perfectly round. Their small size differentiates them from the enlarged extremity of the bacillus. Although these granules will be considered as spores of Neisser and Ernst, in the opinion of the author, as a result of his investigations and staining methods, these forms should be considered not as spores, but as the so called chromatin granules, an albuminoid substance very susceptible to carbol-fuchsin and about which so little is definitely known. In order to determine the longevity of the bacillus and its vitality during propagation, a month long systematic carrying over of an original culture upon agar, at first daily, and afterwards every second day, was instituted. Each tube remained in the incubator, three days at 37°, was examined and put back for two days more. Only on the fifth day was the first indication of any growth perceived. Both the original culture and the later generations were always under similar conditions of temperature and were prevented from evaporating by means of rubber caps. A second series of experiments was then undertaken in which the parent culture remained in the temperature of the room, (which had a wide variation, it being winter), without the rubber cap. Grafts were then made and placed in the oven for five

days. From the tabulation which follows it appears that the material can be successfully used for twenty days provided the parent culture remains always under favorable conditions of moisture and temperature, but its term of life and capacity for reproduction rapidly diminish according as conditions of dryness or low temperature obtain. These facts speak with certainty against spore formation, because if this bacillus was able to go into a resting condition by spore formation, reproduction would not cease in so short a time even under relatively unfavorable conditions, for the resistance of the spore to adverse conditions is too well known. Thus it is seen that the reproduction is by segmentation, which begins during the first day by an increase in length and a separation of the cell body resulting in the formation of spaces and individual segments. As the culture media become exhausted the spaces and segments continue to form, till finally the vitality of the bacillus becomes extinct, disintegration follows by which the segments become free and ready to form a new organism when fresh nourishment is offered. To admit the formation of the young bacillus *in loco* would contradict all former bacteriologic experience. The space formation in individual end segments parallel to the long axis of the parent form is to be considered merely as an involution form.

The pathogeny of this bacillus was studied by means of inoculation experiments upon men and animals in which pure cultures were applied directly to the conjunctiva and injected into the parenchyma of the cornea. Before each inoculation the absolute pureness of the culture, and the germs already existing in the conjunctival sac were of course determined. Three bouillon cultures of different ages (one, three and six days respectively) were placed in the sacs of three rabbits each, and the nine animals were isolated. In two of the animals, on the third and fourth days, a slight hyperæmia and a discharge containing only cocci were noticed. That there might be no source of error through dilution from the tears, in a second set of experiments the material, $\frac{1}{2}$ cc. in amount, was injected directly into the conjunctival tissue with a negative result. Into pockets made by a sterilized knife pure agar cultures were inserted and as a "control" a similar pocket was allowed to heal without contamination. While the latter healed by first intention the three former corneæ presented on the following day a grayish white opacity which went on to infiltration together with iritic irritation on the day after. Healing was complete in eight days without further increase in the process, the

conjunctivitis, being simple and non-typical and passing away quickly. This bacillus has therefore limited pyogenic properties. One cc. of a pure culture, diluted with distilled water, injected into the cornea caused no reaction. Therefore the inoculation of rabbits must be considered as absolutely without success in producing an acute inflammation similar in character to the one now under discussion. Resulting from inoculations made upon seven individuals it was found that this segmented bacillus had an influence upon the human conjunctiva. Four of these had an acute conjunctivitis resembling that characteristic of the epidemic but milder and of shorter duration, there being redness and swelling of the lids, especially of the fold of transmission, muco-purulent discharge, photophobia, pain and the typical bacilli. The other three subjects probably possessed strictly normal conjunctivæ which accounts for the immunity, while the lids and conjunctivæ of the other four had undergone inflammatory changes of varying intensity. A strictly normal mucous membrane is not only a poor breeding place for microorganisms but according to recent investigations actually possesses some bacteriocidal properties. There must also exist a predisposition in certain individuals, for, as is well known, tubercle bacilli can remain in contact with the mucous membranes of certain individuals without exciting either local or general reaction. A relative immunity may in part explain the different degrees in intensity in the inflammatory reaction in different individuals.

In order to determine whether this bacillus was ever present in the secretion of other acute and chronic conjunctival inflammations, at a time when an acute conjunctival catarrh prevailed, Dr. Gelpke examined bacteriologically fifty individuals, as they appeared with regard to the microorganisms contained in their conjunctival sacs. Such bacilli as were found were examined with great care to determine whether his bacillus was present or not. The appended table shows the segmented bacillus to have been present in eighteen individuals, fifteen of whom had "Schwellungskatarrh;" two, acute follicular catarrh and one, acute conjunctival catarrh. Therefore this bacillus is not often found as an intruder but is always found in that form of the disease which characterized the epidemic. Thirteen individuals or 26% were found to have acute follicular catarrh; of these six had symptoms pointing towards a simultaneous "Schwellungskatarrh" and among the remaining seven, who really had only slight inflammatory symptoms, the segmented bacillus was found only twice, consequently

the first six should not be considered as typical follicular disease but really the epidemic variety. The follicle is in this connection to be regarded as a secondary symptom, resulting from irritation. Follicular disease is the result of another organism probably a coccus not yet identified.

Although the bacteriologic work regarding the fungi appearing in infectious diseases during the last decade is extensive, relatively few are those who have attempted to discover the specific cause for individual eye diseases. With the exception of the accurate and exhaustive contributions of Bumm, Michel and others concerning certain organisms causing certain diseases, for example, the gonococcus and trachoma coccus, very little is definitely known about the cause of other acute conjunctival diseases. Weeks in 1887 described a small bacillus present in the secretion of an acute catarrh, which was always contaminated with a "club-shaped" form. Pure cultures of the latter caused no reaction. Weeks probably had to do with two forms of the same bacillus instead of different bacilli as this would in the Author's opinion easily explain the difficulty of obtaining pure cultures of the smaller, since the larger is probably only an involution form of the smaller, and as no mention is made of spaces in the cell body, it must be regarded in no way identical with the segmented bacillus. Koch and Gaffke found in a highly contagious conjunctivitis some small rods resembling those of mouse septicæmia, and Kartules succeeded in growing the same on agar as fine, grayish points becoming confluent, making a stripe having a fatty appearance, which he considered as identical with the Leber-Kuschbert Xerosis bacillus, but this Gelpke doubts after examinations of Leber's preparations. Schmidt found a form resembling the albus morphologically and Parinaud one resembling the gonococcus which Morax identifies as the streptococcus. The organisms found in the fibrinous or croupous inflammations do not resemble the segmented form. The Xerosis microorganism, however, somewhat resembles it although an examination of a tabulation of the literature shows many differences in form, growth, etc. It is found in acute and chronic conjunctival conditions uncomplicated with xerotic changes. Variations in length and breadth of 0.8-2 m and 0.2-0.6 m respectively have been found. As regards its shape, observers have considered it to be a short bacillus with straight sides and rounded ends, or a double rod, or, partly straight or partly curved rods made up of light and dark plates; or, as short pointed rods without segments, later becoming fan-shaped. To some it is motile; to

others, non-motile. According to some, reproduction takes place by segmentation; to others, by gonidia formation and to others by spore formation. The most favorable temperature is 37-39 C, although others have succeeded at 35. It grows better on serum first and on agar later. The colonies on gelatine become confluent; on agar as a thin deposit without characteristic appearances; on serum as white pin-head colonies becoming confluent; and as a dry shining, 2-3 mm. broad stripe, or as small, sharply defined non-serrated colonies which form rosettes and never become confluent. Only two have succeeded with potato. Bouillon becomes opaque. Kuschbert and Neisser obtained a moderate inflammatory reaction while Leber describes a catarrhal condition of the conjunctiva which might be somewhat due to staphylococci present. In short the descriptions of the xerosis bacillus are, in its morphologic and biologic relations, so conflicting that it is not possible to believe in its existence *sui generis*, but that various bacilli more or less related have been considered. The segmented bacillus agrees with some of the xerosis complex in being non-motile, growing in the oven, and not at the room temperature on gelatine; does thrive on potato; probably both grow in bouillon in a similar manner, although it remains clear in one case and not in the other. Primary cultures do not succeed well on agar. In form there are many resemblances between the segmented bacillus and the bacillus of xerosis. The discrepancies in description are probably due to the fact that some of the involution forms have been mistaken for the original bacillus, and it is to these transition forms that the segmented variety bears some resemblance.

In the appearance of the primary bacillus is to be found the striking characteristic which differentiates the segmented variety from all others and gives it a separate position, that is still further reinforced by its particular behaviour when placed upon the human conjunctiva which the xerosis bacillus does not possess or only in a slight degree. The question whether the segmented bacillus, in spite of apparent similarities, must be considered a heterogenous organism, or, whether a virulent form of the generally non-virulent xerosis bacillus is being considered, must remain undecided. It is certain that reproduction is by segmentation in the one case while recently Ernst and Neisser have claimed spore formation as being the manner of reproduction in the so called xerosis bacillus.

At all events there seems to be no reason for including the segmented form under the "collective name" xerosis bacillus and it seems

as if it should be designated with reference to its most marked characteristic, so apparent in its earliest stage of existence as the *Bacillus Septatus* or in case this name should be adopted for the so called xerosis bacillus it could receive the more exact and comprehensive title of *Bacillus Septatus conjunctivitis epidemica*. A valuable bibliography, comprising bacteriological publications between 1883 and 1895, concludes Dr. Gelpke's monograph.

WM. DUDLEY HALL.

REPORTS OF SOCIETIES.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

The regular meeting held February 9th, 1897.

Dr. W. T. Montgomery, President, in the chair.

A case of *Keloid of the Cornea* was described by Cassius D. Westcott, M. D. In February, 1895, a baby two years old was seen with a disfiguring prominence on the cornea of the left eye. Parents, who were Scandinavians, gave the following history: Three or four days after birth the left eye became swollen and red and discharged yellow matter. No ophthalmologist was consulted until the cornea had become opaque. The mother says there was no change in appearance of eyeball for six months and then the front of it began to grow and continued to do so for six months and then ceased. Eye never seemed painful. The lids were never closed over the projecting eyeball.

From all appearances it seemed to be a case of total staphyloma with thickening and epidermization of the cornea and an abscision was advised, but on examination under an anæsthetic it was discovered to be a solid tumor. On examination of the specimen, after abscision and evisceration, the cornea was found to have been perforated and the iris adherent throughout its entire extent and that the cornea was uniformly thickened, measuring in the center nearly 8 mm. in thickness. The external surface was rough and the color that of the integument. The wound healed kindly and several months after the operation the cicatrix was normal and the stump freely movable in the orbit. The specimen was placed in Fleming's solution and the hardened cornea examined by Dr. Hektoen, Professor of Morbid Anatomy and director of the laboratories at Rush Medical College, who made the following report. The sections (30 to 40 microns in thickness) were stained with hæmatoxylin and eosin according to Van Gieson's method. Microscopically, the anterior epithelial covering is found somewhat but uniformly thicker than normal and the cells composing it are more flattened than usual while those upon the surface have formed a relatively thick, horny layer, so that the cornea is provided with a distinct "stratum corneum." In some places the lower layer of cells is of a brownish color, but otherwise the anterior epithelial layer of the cornea is free from pigment, but the conjunctival epithelial covering present is the seat of a light brownish diffuse pigmentation.

Bowman's membrane is not conspicuous, its place being taken by

fibrillated material. Under a low power the substance proper of the cornea is seen to consist of a densely lamellated structure, the lamellæ running parallel to each other, but are broader and irregular as compared with those of the normal cornea. Distinct fibrillated bundles run obliquely or transversely across the sections and often split into smaller bundles. Between the lamellæ are irregular narrow spaces that seem to contain nuclei; the inter-lamellar spaces are larger and plainer in the posterior strata of the sections. The substance proper seems to be avascular. In thicker sections (10 microns) the lamellæ are seen to be composed of fine and coarser fibrillæ that interlace rather irregularly and the interfibrillar and interlamellar spaces contain connective tissue cells with large flattened nuclei (corneal corpuscles). Their number is not increased. The posterior basal membrane is absent over one half of the posterior surface of the cornea, its place being taken by lamellated material; the posterior endothelial layer is absent completely and its place is taken by an irregular layer of yellowish and brownish pigment granules and masses of varying thickness; whether the brownish pigment is all enclosed in cells or not could not be determined. "The diagnosis would be, hyperplasia of the substance proper of the cornea (keloid) with epitheleosis of the anterior surface and a pigment layer upon the posterior surface due to prolapse of the iris."

Dr. Wescott after an extended search of the literature was only able to find two cases which at all resembled his case. One is reported by R. Simon in the *Centralblatt für practische Augenheilkunde*, 1882, page 193, the other by I. Szokalski, Warsaw, in the *Annales d'Oculistique*, 1865, page 209. He thinks the term keloid as applied to this case might be open to criticism. For histological reasons it might perhaps be called a case of chronic inflammatory hyperplasia; but in its genesis it certainly resembles keloid.

Dr. Lyman Ware reported a *Case of Panophthalmitis following Cataract Extraction*, dacryocystitis being present at the time of the operation. The conjunctivitis and dacryocystitis were treated with nitrate of silver and other astringents without special benefit, and it was not until a solution of formalin, 1 to 5000, was used that any improvement took place. Five months after the patient was first seen a preliminary iridectomy was done on both eyes with good recovery, the eyes not being bandaged, and the formalin solution used three or four times a day. Two months later the cataract was extracted from the right eye. The wound was made at the sclero-corneal margin,

coming out well back in the conjunctiva, making a good flap. The after-treatment consisted of washing the eye with a solution of formalin three times a day and having it covered with a wad of absorbent cotton soaked in the same solution. For the first two days the eye had all the appearances of making a good recovery. No pain was present and the wound was perfectly clean. On the third day the wound began to show signs of infection. The cornea soon became involved, panophthalmitis set in and the eye was totally lost. Under ordinary circumstances Dr. Ware would not have ventured to operate on the cataract until several months had elapsed after the apparent cure of the dacryocystitis, but as the man had been blind so long, was old and feeble and thought he could not return again to the city, and especially as the formalin solution seemed to control the dacryocystitis so well, he thought he was justified in making the attempt to restore vision.

Discussion.—Dr. A. B. Hale thought an operation for cataract should never be done if there was the least trace of dacryocystitis. In many chronic cases it was advised to excise the tear sac, the extraction being postponed until the wound had healed.

Dr. W. Franklin Coleman mentioned a case of extraction where conjunctivitis, with muco-purulent discharge, was present, and yet a good result followed. A preliminary iridectomy was done followed, in two weeks, by extraction.

Dr. Edward L. Holmes had the same experience in similar cases.

Dr. Horace M. Starkey said that the only case of suppuration after cataract extraction in his experience happened in a case similar to that of Dr. Ware. The wound did well for 72 hours and then suppuration set in with destruction of the eyeball.

Dr. Gradle asked if any member present had tried obliteration of the tear duct with the galvano-cautery.

Dr. W. T. Montgomery has closed the punctum with a hot wire. He thought that in cases of cataract extraction complicated with conjunctivitis a preliminary iridectomy should be done, and he believed that there is much less danger of infection if the incision be made downwards and with a conjunctival flap, followed by flushing the eyeball with boracic acid solution.

Dr. Holmes asked the most recent method of destroying sac.

Dr. A. B. Hale thought the Kiel method gave the best results—by cutting the sac out.

Dr. W. Franklin Coleman enquired if any member present had

tried Fick's method of chloride of zinc injections into the sac, thereby obliterating it.

Dr. A. B. Hale has tried it but stenosis resulted.

Dr. J. Elliott Colburn removed six sacs by the Kiel method with good results.

Dr. H. Gradle has noticed that where the patient complains of lachrymation only when exposed to the wind the chances of a permanent cure are better than where the watering is continuous. In cases of stenosis he divides everything with the knife and does not depend on reducing stenosis by pressure.

Dr. W. T. Montgomery has had similar experience to Dr. Gradle, in that the duct closes up immediately after passing the probe alone and cannot even inject solutions with the syringe.

A Case of Paralysis of the Third Nerve was presented by Dr. W. H. Wilder. H. B. aged 25. First seen Feb. 19, 1896. Mother died at age of 26, of cancer. Patient contracted syphilis five years ago. December 25th, 1895, he first had diplopia, followed soon after by ptosis of the left upper lid, coming on suddenly without previous pain except slight frontal headache. At times there were attacks of dizziness. Examination shows paralysis of external muscles supplied by the third nerve. Pupils react to light and convergence and the patient can accommodate to $4\frac{1}{2}$ inches. R. V. $\frac{5}{6}$; L. V. $\frac{5}{6}$. No fundus changes. The lesion is probably in the nucleus of the third nerve, although it is uncommon for a nuclear palsy to be unilateral.

Not until this patient had taken a dose of seventy-five grains of potassium iodid, three times a day, was any effect seen on the syphilitic paralysis. Then power began to return to the levator palpebræ and as the dose was increased the superior rectus began to act; then the inferior oblique, inferior rectus and internal rectus, in the order mentioned. At present he is taking 160 grains of the iodid at each dose or one ounce a day. Dr. Wilder presented him chiefly as an illustration of the fact that the curative effects of potassium iodid are not exhausted with moderate or even with large doses, and to show what may be accomplished in syphilitic paralysis by the administration of heroic doses of the drug.

Dr. Wilder also presented the following *Case of Thrombosis of the Retinal Vein*. Mr. E. G., 55 years of age, and apparently in perfect health, noticed on Friday, January 15th, at about 1.30 that the sight of the left eye had failed completely. There was no pain accompanying this trouble. When he was first seen, about thirty-six

hours later, there was absolute blindness of the left eye. The pupil did not react directly to light, but reacted consensually and also to accommodation. Ophthalmoscopic examination showed pronounced edema of retina. The outline of the optic disc could not be distinguished. The veins were enormously distended and tortuous, filled with dark colored blood, and had in places a sausage shape. The arteries were obscured in many places and seemed about the normal calibre; numerous hæmorrhages were seen scattered throughout the retina. These appeared to be in the fibrous layer and were striated and frequently fan shaped, in places covering the vessels. The vision of the right eye was normal with Sph. + 2 D. The patient said he had kidney disease several years before, but an examination of the urine showed no albumin. There seemed to be a roughness of the first sound of the heart over the apex, and the second sound was accentuated at the base. At the present time he has slight perception of light downwards to the temporal side. The swellings and hæmorrhages in the retina have disappeared in a great measure; the veins have become smaller and have changed in places into white cords. These are seen best in the region of the optic disc. The arteries are also smaller than normal. It seems almost unquestionable that we have here to deal with a case of Thrombosis of the central retinal vein.

Dr. Casey Wood presented a patient suffering from *Paralysis of the Ocular Muscles due to Lead Poisoning*. The patient, aged 49, a painter, has had several attacks of lead colic, the first five years ago, followed in two years by an attack of vertigo coming on suddenly one morning. He was then unconscious for half an hour and had pain through his head for two days at the end of which time he complained of diplopia, and in three weeks noticed that his left eye turned out. There is no history of syphilis or injury to the head. At the present time L. V. is $\frac{2}{3}$; R. V. $\frac{2}{3}$; both unimproved by glasses. There is complete left *Ophthalmoplegia Externa*, with the exception of the external rectus and possibly the superior oblique. Ptosis is most marked when patient is not fixing. Pupils react very sluggishly to light and accommodation. With the ophthalmoscope few fundus changes are visible, but the outlines of the papilla are not clean cut; it has a woolly appearance. F. of V. in both eyes are decidedly contracted for white and colors. Dr. Sanger Brown reports that, with the exception of the oculo-motor pareses and optic nerve defects, there is nothing abnormal about his nervous apparatus. Dr. Arthur Elliott found urine and saliva practically normal and free from traces of lead.

Dr. J. Elliott Colburn presented a *Case Resembling Nephritic Retinitis*, in a boy, who when first seen had loss of vision in the right, with lowered vision in the left eye. Slight convergent squint has been present since early childhood. He had just recovered from typhoid fever when the blindness set in. The ophthalmoscope showed characteristic whitish spots, with hæmorrhages, as seen in retinitis of nephritic origin, although the patient has had no nephritis.

C. P. PINCKARD,
Secretary.

SECTION ON OPHTHALMOLOGY.

College of Physicians of Philadelphia.

Meeting January 19, 1897. Dr. William F. Norris, President, in the chair.

Dr. Clarence A. Veasey read, by invitation, a paper on *Binasal Hemianopsia*. A woman, aged 54, had noticed gradual failure of vision for five months, and, two months earlier, slight attacks of nausea and vomiting for three weeks. At the time of the examination there was slight tremor and vertigo. Three weeks before coming under observation the vision suddenly declined in R. to l. p., in L. to $\frac{1}{180}$. There was no history of syphilis or tumors and no impairment of hearing, speech, or memory. Wernicke's hemianopic pupillary sign was present. Tn. The ophthalmoscope showed a low grade of double neuro-retinitis, more marked in R., indicating a long-existing interstitial optic-neuritis. The blood and urine were normal. Binasal hemianopsia was the prominent symptom. In the R. the macula was included in the blind half and the line of demarcation between the blind and preserved fields was distinctly vertical. In the L. the macula was included in the preserved half, which expanded in its upper part towards the nasal side. The field for red in the L. was fan-shaped and included the macula, and here the blind portion encroached slightly above and below on the temporal side. Both fields were concentrically contracted. Central vision improved for a short time under treatment, but the fields became more and more concentrically contracted and preserved their hemianopic character. Death ensued within a few months. An autopsy, which was refused, would have probably shown a bilateral inflammation of the trunks of the optic nerves in front of the chiasm extending backward to the chiasm and more marked symmetrically on each side of the latter.

Discussion.—Dr. G. E. de Schweinitz: I have seen several cases. The first, originally described by Dr. H. C. Wood, had faint light perception in one eye, and in the other the field of binasal hemianopsia. The second was a girl of sixteen, who had symptoms of basilar meningitis, high choked discs, vomiting, nausea and staggering gait, intense headache, and loss of both nasal fields. The third case, a girl of 20, was one of brain-tumor. She also had high choked discs, very imperfect vision, and binasal hemianopsia. After death a large basal tumor was found. The last of the cases is an illustration of the symptom occurring in spinal cord disease like that reported by Bull and Lang. A miner, 55 years old, a hard drinker, with a specific history, had blanched discs, spastic gait and exaggerated knee-jerks, and binasal hemianopsia. The lesion probably was an interstitial change in front of the chiasms. I am uncertain whether these cases ought to be classed among the hemianopsias or in some other category.

Dr. G. C. Harlan: There was at one time a good deal of discussion of Binasal hemianopsia, with reference to its bearing upon the theory of semidecussation in the optic chiasm. It is impossible to explain it by any single lesion and this fact has been alleged as a weak point in the semidecussation theory. Bitemporal hemianopsia can be accounted for by a lesion in front of the chiasm, involving the inner halves of the optic nerves, or behind the chiasm involving the inner halves of the optic tracts; but no single lesion can be so placed as to satisfactorily explain binasal hemianopsia. In preparing a paper on hemianopsia some years ago I was unable to find a detailed account of any case of binasal hemianopsia quite free from complication, and Schoen had stated that there was at that time no entirely incontestible cases on record. I believe that this statement still holds good—that there is no case with similar fields on each side sharply defined by vertical lines of demarcation, such as we meet with in homonymous bilateral hemianopsia.

Dr. G. Oram Ring read a paper on *The Application of the Roentgen Rays in the Diagnosis of Foreign Bodies in the Vitreous*. Two radiographs, showing the presence and the approximate location in the vitreous of a piece of metal, and the patient upon whom Mule's operation had been performed, were exhibited. Eighteen months previously a piece of steel had entered the right eye through the cornea, producing a tear in the iris, cataract, and complete blindness. The eye had become subject to attacks of ciliary inflammation, and recently the left eye had shown signs of sympathetic irritation. The steel

surrounded by exudate could not be dislodged from its position in the ciliary body by the Hirschberg magnet, and evisceration was performed and the glass sphere inserted. Very little reaction followed.

Discussion.—Dr. H. F. Hansell: The case I reported in the discussion in December was exposed for eight minutes, and the skiagraph shows exactly the position of the foreign body in relation to the shadow of the bone; but this picture demonstrates what mine does not, namely, that the Röntgen rays will cast the shadow of a piece of metal lying in any part of the vitreous. This method is extremely valuable and now almost essential in the diagnosis of the presence and composition of foreign bodies.

Dr. George Friebis: I prefer decidedly evisceration to enucleation when feasible, and am gratified to find the reaction may be insignificant.

Dr. C. A. Oliver: It must be remembered that should the vitreous contain blood-clots the magnet must be brought almost in contact with the metal before the latter can be moved from its position; and, again, should the metal, during its passage through the vitreous, fall from the magnet, it may pursue a direction entirely different from that in which it had been carried by the magnet.

Dr. Edward Jackson exhibited two cases of *Preservation of the Eye, with Good Vision after the Removal of Fragments of Steel from the Vitreous by Means of the Magnet*. Both patients were young men injured by fragments from hammers. One had been shown to the Section shortly after the extraction was done, three years ago. The wound of entrance through the insertion of the internal rectus muscle was enlarged and an incision made in the vitreous with the Graefe knife in the direction of the foreign body, which lay on the retina at the bottom of the eye. The operation was followed by some detachment of the retina, retinitis, and a general hyalitis. At one time the vision was reduced to counting fingers within one foot, but it slowly improved until now it equals $\frac{3}{4}$ partly, although the pigmentation and the exudation in the retina, even in the region of the macula, are quite marked and a slight local detachment exists at the original site of the foreign body.

In the second case the chip of steel entered through the cornea and iris, close to the periphery. Hemorrhage at first prevented its exact location, and the injury was treated with atropin and ice, locally, and rest in bed. In two days the media were quite clear. The lens, the edge of which could be seen through the coloboma in the iris, en-

tirely escaped injury. The piece of steel was found lying slightly in front of the retina (3—4 D.), two disc diameters below the optic nerve. An incision was made between the inferior and internal recti and the foreign body extracted with the magnet. A protruding portion of the vitreous was clipped off. Ten days later the eye with its correcting lens, $38\text{D} + 2.75\text{C}$. had nearly equal vision with the other, which required a similar glass. At the end of the month there remained some opacities in the vitreous and a marked area of choroidal atrophy in the part adjoining the point from which the foreign body had been removed. This atrophy was distinct ten days after the injury. Vision equal in the two eyes.

Dr. F. M. Perkins exhibited a *Case of Congenital Microphthalmos*. The patient was a young woman with no significant history. The right eye was very much smaller than the left and was entirely blind. Vision in the left was of full acuity. No other part of the body was congenitally deficient.

Discussion.—Dr. Chas. Shaffner: I have seen several cases of microphthalmos that without exception have been associated with lack of development of the corresponding side of the face.

Dr. S. D. Risley presented briefly the clinical notes of *Two Cases of Persistent Asthenopia* with progressive change in the corneal curvature and increase of refraction without the occurrence of posterior staphyloma. A notable feature in one case was a marked, almost sudden increase of the corneal astigmatism as shown by the ophthalmometer, and the disappearance at the same time of a hitherto persistent esophoria of six degrees for distance.

Dr. G. E. de Schweinitz described a *Case of Acute Syphilitic Tarsitis* occurring in a man about 30, between the eighth and nine months after the primary infection. Both eyes were affected.

Also, a *Case of Suppurative Tarsitis* occurring in a physician aged 40, in which without evident cause a suppuration appeared in the right lid occupying the position of the tarsus, which was enormously thickened. Five points of suppuration appeared in the margin of the lid, and when the tissue between these points was incised, a slough, apparently including the tissue of the tarsus, was removed. The surrounding glandular and connective tissues were also included in the morbid process.

Also, a *Case of Ectropion Uvae*. The overflow of the uveal pigment was in the upper and outer portion of the pupillary margin. The patients clinical history indicated that an injury was the cause of this condition, although there was no external scar.

Discussion.—Dr. C. A. Oliver: In the case of ectropion uvea it is possible to follow the minor circle of the iris along the border of the pigment. A number of small depressions is noticeable that possibly originate in the posterior limiting membrane, and the vascular ridges are still present, running from the larger to the smaller circle. When the pupil is contracted there is an eversion of the retinal pigment, so that the pigmented circle is completed.

Dr. G. C. Harlan showed a patient with a *Cilium in the Anterior Chamber*. It had recently been introduced through a wound at the lower corneal margin, inflicted by a piece of steel. The iris was adherent in the cicatrix. The cilium was stretched across the pupil with its bulb on the nasal and its point on the temporal side of the iris. The patient had made a good recovery. Dr. Harlan had reported two other cases in the Wills' Hospital reports two years ago. In none of these cases did the cilia seem to cause irritation. He thought that simply as a foreign body the presence of a cilium in the anterior chamber was harmless. The danger is from the engrafting upon the iris of epithelial cells carried in with the bulb. This had, in a number of reported cases, given rise to epithelial or "pearly" tumors of the iris, which sometimes appeared years after the accident.

Discussion.—Dr. Oliver: There is pictured by Meyer, in the *Centralblatt f. Augenh.*, January, 1889, two cilia which remained in the anterior chamber thirteen years without creating reaction.

Dr. Oliver gave the details of an *Operation for the Cure of Cicatricial Ectropium from Antral Disease*. The case was that of a fourteen-year-old girl who in infancy had had an alveolar abscess in the right upper jaw, followed by the formation of a fistulus sinus, which remained open and discharged until she was nine years old. At the time of examination it was found that the entire inferior orbital margin was lost. The overlying skin and superficial tissues were dragged deeply inward into a series of bands, whilst the lower lid was so everted that the lower cul-de-sac was visible. The operations pursued were those of first freeing the bands subcutaneously by a tenotome introduced far out in the temporal region, followed by three repetitions of Dieffenbach operation along a Szymanowski cut, and later the excision and filling in by suturing, of a triangular area in the upper temporal region, thus almost entirely relieving the deformity without the appearance of any external cicatrices.

Also, an *Operation for Cicatricial Ectropium with Advancement of the Levator Palpebrae*. The patient was an eight-year-old boy, who four

weeks before being seen was hooked in the left eye by a cow's horn in such a way that almost the entire conjunctiva of the upper lid and cul-de-sac were everted, nearly three-fourths of the tarsus having been lost. The upper inner part of the ciliary border of the lid was bound down to two dense superficial cicatrices. To remedy this deformity the bands of adhesion were loosened, a broad wedge was cut out of the prolapsed and redundant mucous membrane and stitched together, the lids were set into proper position by a series of sutures which extended through the entire lid substance, and the internal angle was fixed by a deeply placed double thread. To remedy the drooping of the lid, the only defect left, the false and irregular attachment of the broad tendon of the levator muscle was reached by a series of dissections through the skin, the orbicularis fibres and the deeper lying cicatricial tissues of the upper lid. The muscle was then secured by two strong sutures loosened from its false attachment far back and up beneath the orbital ridge, and lowered and attached to the remaining narrow rim of tarsus running along the ciliary border. The wound healed without any disturbance and the lid movement became as good as that of the fellow eye.

Also, a case and water-color sketch by Miss Washington, illustrating Nordenson's views of Leber's theories regarding the origin of *Rupture of the Retina in Retinal Detachment*. The case was that of a 53 year-old myope, who had the condition well marked for a period of more than a year without history of traumatism or relevant dyscrasia.

HOWARD F. HANSELL.

Clerk of Section.

THE OPHTHALMIC RECORD

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NO. 3. NEW SERIES.

EDITORIALS.

A PLEA FOR THE MORE GENERAL USE OF THE OPHTHALMOSCOPE.

During the last fifteen years the modification in the methods of ophthalmic practice have greatly benefited both the patient and the practitioner, and a systematic use of ophthalmometry and skiascopy have greatly facilitated the selection of proper glasses in cases of refraction and both have come to be considered almost as a necessity in those perplexing cases of a mixed character, while in the application of these methods such difficulties as may have arisen have been surmounted, so that with the array of ingenious devices and improvements upon the existing models in use, results are more accurate and more speedily obtained. In the determination of heterophoric conditions the old fashioned method of frequently changing the prism in the trial frame has now given way to the more convenient rotary prism, and the trial frame itself has likewise yielded place to a more pretentious and stable competitor. As proof of the popularity of these objective methods may be taken their ready adoption and the enthusiasm displayed by the advocates of this or that procedure or of some particular piece of apparatus. This spirit of progress, displayed by the younger men and the easy acceptance of existing conditions by those who are fortunately more capable of deciding by their longer professional activity are commendable, nevertheless by depending so much upon these more modern methods of diagnosis are we not somewhat in danger of allowing a valuable and formerly much used method to be neglected and thereby, possibly, rendering ourselves less acutely sensitive to very

slight fundus changes? With the introduction of the refraction ophthalmoscope came the possibility of viewing an upright magnified image of the fundus, and by proper application of its optical possibilities, of examining the interior of the eye at different planes and thus enabling one to form an estimate of the condition of the refraction of the eye. When this was the only method of supplementing the trial case the very difficulties met with in becoming skillful in its use were in themselves a splendid means of training the observer to accuracy in general ophthalmoscopic work. As a rule too much is usually expected of objective tests and when after trial they fall short of expectations aroused by those who are presumably especially familiar with their use they are apt to be disappointing, but, although one may never hope to attain the degree of excellence of certain individuals in the use of the upright image in determining errors of refraction still persistence in its use in this respect will ultimately be of the greatest benefit to the conscientious worker in general ophthalmoscopy.

W. D. H.

HOW SHALL WE TREAT THE OPTICIAN?

As the time for medical meetings approaches, the advocacy of reforms connected with our profession should be emphasized.

One of the conspicuous ophthalmologic evils that should be annihilated is the performing of refraction work by persons not properly qualified to *practice medicine*. This matter might as well be handled without gloves, in spite of the unprincipled effrontery of the offenders and the ignorant support of the laity, who always stand in their own light when great reforms for their benefit are advocated.

The study of refraction and its errors, with the coincident questions involving ocular motility, constitutes the profoundest problem in ophthalmology. Its intricacies have taxed the brightest intellects, and it may be truthfully said that only a chosen few have thoroughly mastered the subject. If this be true, the practical application of such evolved truths upon the human eye should be permitted only to those persons who have acquired a comprehensive knowledge of the anatomy, physiology and pathology of the eye, together with some special training in the study of refraction, its errors, etc.

It may be remarked, in this connection, that the eye is not an optical machine, nor a kingdom set off by itself and amenable to individual laws and government. It is a part of the body corporate, and must always be so considered and treated. We must remember

the frequent association of ocular affections with other diseases, and the constant occurrence of intra-ocular lesions only to be diagnosed by ophthalmoscopic and other examinations. It is certainly a *terra incognita* to one depending merely upon optical and visual tests for a diagnosis.

If it be true that correcting, or attempting to correct, errors of refraction is working in a true realm of ophthalmology, it is also true that any one doing such work is practicing ophthalmology. Any one practicing ophthalmology is practicing medicine, and no one should be allowed to practice medicine without a license in states possessing adequate state laws. Therefore the individual who assumes to do refraction work without a medical license is practising medicine without a license, and is a legal offender against the state, and should be held responsible.

Usage does not make wrong right. The barber at one time was the recognized surgeon and dentist. The druggist, a few years back, virtually practised medicine. Within the recollection of us all, any one might practice medicine wherever and whenever he chose without a diploma. But were these usages right? Emphatically, no! And yet the correction of these evils was opposed by those malevolently interested and by the ignorant public, for whose benefit improving laws have been passed. Therefore the protest of the optician who feels it to be his vested right to "fit glasses" should be disregarded, and the opinions and prejudices of the ignorant public, who always oppose the progress of advanced thought, should be disregarded, and the matter should be placed upon its proper basis.

The term "optician" has been used rather broadly, and includes traveling "refractionists," those doing business in department and jewelry stores, and those resident and prescription-filling opticians with a strong predilection toward refraction work in a "back parlor."

There are many opticians (for which we are profoundly grateful) who do a legitimate prescription business, and who make no feature of refraction work, only selling a pair of glasses now and then on their own responsibility as they are *compelled* to. They recognize that the optical profession is an honorable and exalted calling, and one taxing their time and ability to correctly follow. Such men are an honor to their profession, and have a comprehensive idea of its uses and limitations, and will (it may be confidently asserted) rejoice at any and all procedures that aim at an eradication of this evil.

Let this matter be brought up at some of the meetings this year, and, peradventure, a remedy may be obtained.

The opticians should at least purify their own ranks, and see that laws are passed, by which those seeking to dispense (*not prescribe*) glasses in a given state must receive a license to do so by a board of optical examiners.

A man desiring to be a dentist, a druggist, or a horse doctor, must present proper credentials, but any one with a few weeks of desultory instruction, or no instruction at all, may become an optician and assume the right to plunge into the study of refraction—the profoundest subject of ophthalmology.

F. A.

WHAT SHALL BE DONE WITH THE OPTICIAN? ANOTHER VIEW OF THE MATTER.

This question seems to be disturbing the minds of many oculists, especially in the smaller cities. My own opinion is that the less done in the way of organized interference with his spectacle-fitting work, the better. There is no doubt that most of it is not strictly accurate and that occasionally, in the case of active disease of the eye, precious time is lost through the optician's attempt to remedy the trouble with glasses. But the effort to prevent this by law is, for the present, at least, a mistake. The great majority of the laity and even a large part of the medical profession regard the optician very much as the lower classes of foreigners regard the midwife, namely, as a person who, in a large proportion of cases, can take the place of the physician, at a much lower cost; and the attempt to interfere with his work will be certain to fail, with the result, secondarily, of much unjust criticism of the motives prompting the effort. Many persons use glasses obtained from opticians with perfect comfort and occasionally the lenses prescribed by the oculist, for some reason, give less satisfaction than those from the optician; and as long as the expense of glasses from the latter is so much less than for the advice of an oculist plus the ordinary price of glasses, the average person, unless there is some influence to the contrary, is apt to give the optician at least one chance.

This suggests the question whether it is any more than right, on accepting a patient's fee, to take a reasonable amount of pains to save him unnecessary expense for his glasses. The practice of writing a prescription and allowing the patient to have it filled by some optician whose work and prices the oculist does not control is certainly objectionable. The work, though as a rule accurate, may through an oversight be incorrect; and the price charged is often exorbitant.

considering that the optician has spent no time in fitting the case. Both these objections may be obviated by sending the patient to an optician who will agree to fill all prescriptions at very little above the wholesale rate, all work being returned to the oculist for inspection; or by the oculist himself getting the glasses for the patient at wholesale cost, letting him understand exactly what is paid for the glasses and what for professional services, thus avoiding the idea that the oculist is in the spectacle-selling business. To the writer, it furthermore seems no more than reasonable to agree that if the lenses need changing within a year or two no extra charge will be made for ascertaining what change is required. This of course entails some extra work, to be done for nothing, but it really amounts to very much less than would naturally be expected and is quite insignificant in comparison with the increased satisfaction given to ones patients and the decided advantage which it affords from a scientific standpoint. One is apt, after prescribing a pair of lenses, to think that if nothing more is heard from the patient for some months he must be doing well, while in reality he may simply have gone to some other oculist or, if the lenses have given good satisfaction for many months, he may, to save expense, have gone to an optician who, with the first lenses as a starting point, may be able to make the required change without difficulty. The agreement to keep track of these changes without extra charge, for a reasonable length of time, to a large extent does away with these sources of error and allows the oculist to form a much more accurate estimate of the results of his work and of the natural history of his cases.

H. G.

THE REGULATION OF "OPTOMETRY," IN NEW YORK STATE.

An effort is being made in the state of New York to create a new and separate specialty under the pretense of "regulating" the practice of "optometry" by legislation. The movement is led by C. F. Prentice, of New York, an antagonist of the medical profession, and for years the "oculist" of his own establishment, and by A. J. Cross, also of New York, who has made himself more or less conspicuous through his self-laudatory and pretentious advertisements in Philadelphia, Buffalo, New York and other places which he has visited. They have an energetic organ in the *Optical Journal*, edited by Frederick Boger, with which to manufacture public sentiment. They have gathered

around them sympathetic opticians and organized a "state society" by means of which their efforts may be united and strengthened.

The practice of "optometry" by those not licensed to practice medicine is undoubtedly a violation of the medical-practice laws of the state and these ambitious gentlemen seek to protect themselves by the legalization of such practice under the pretense of "regulating" it.

Last year they attempted thus to "regulate" this business and failed. This year the effort is renewed and happily with the same fate in view. The proposed "regulation" provides for the appointment of a board of examiners by the Regents of the University of the State of New York; the passing of an examination by this board which "*shall confine its examinations to such knowledge as is essential to the practice of optometry*"; the payment of twenty-five dollars; and registering. It exempts all now practicing "optometry" who register; *persons who sell spectacles or eyeglasses without making pretensions to scientific knowledge or skill in adapting to the eye;* and "*all physicians who are or hereafter shall be registered and practicing in this state.*"

The standard of qualification here proposed may mean little to the optician and much to the physician; but as the examining board is to be selected from opticians, it would naturally conform to their knowledge and views, --a standard far too low to protect the public. When men formulate a bill with such meager requirements and such sweeping exemptions, it looks as if they were willing to do anything and concede everything, providing "optometry" be legalized, and they be given the privilege of practicing it "without fear or favor." That there may be no mistake as to what is desired, the bill defines "optometry" to signify the "*employment of subjective or objective mechanical means, or both, to determine the accommodative and refractive states of the eye and the scope of its functions in general for the purpose of adapting glasses to the sight.*" The use of mydriatics is here implied.

This bill has the support of a few misinformed persons, but mostly of those who see in it, directly or indirectly, another avenue to commercial gain, including the "refracting optician," the four-weeks "graduate optician" and the optical "schools," "colleges," and "institutes." It is opposed by legitimate opticians throughout the state, by the medical profession, and by all persons who understand that the practice of "optometry" is necessarily a "delusion and a snare" when not backed by medical knowledge and training.

"Optometry" is purely a medical subject and has been developed entirely by medical men, such as Donders, von Helmholtz, von Graefe,

Javal, Cuignet and others. It deals emphatically with *abnormal and diseased conditions*, and the findings always call for *therapeutic measures*, —sometimes in the form of glasses, sometimes in hygiene, sometimes in medicine, and sometimes in operations. Myopia is essentially a disease and often requires more than glasses, and more than “optometric” study. Hypermetropia and astigmatism are abnormalities which cause diseases (functional) outside of the eye, and the adjustment of “glasses to the sight” may be but a small part of the treatment required. Muscular errors which seem to be local may be due alone to constitutional affections. An “optometric specialist,” unless medically informed, might do much harm by using mydriatics, or by delaying a case which should have prompt medical treatment, or by seeking to relieve reflexes or diseases which do not originate in the eye, or by failing to recognize certain diseases of the eye itself.

“Optometry” should not be legislated into the hands of unqualified persons. No department of medicine requires a larger range of knowledge, a more extended and technical training, and the exercise of more sound judgment than this. It belongs to medicine and to medical men, and to them alone, not for their sake, however, as has been asserted, but for the sake of the public. Neither should there be any compromise by conceding to the optician the right to prescribe for a certain class of cases. The prevailing methods of “testing eyes” by dealers in glasses is wrong and should be stopped rather than encouraged. The non-astigmatic presbyope with healthy eyes can usually select glasses for himself and requires no examination. But whoever needs an examination of his eyes has some abnormal condition or disease, and has no more business with an optician than a person with pneumonia has with a druggist.

If this bill should unfortunately become a law, a great army of “optometric” specialists and pretenders would arise in the Empire state, and their charlatanism would be equalled only by the nostrum-vendor and the travelling quack doctor. Already the Globe Optical Co. has its “Dr. Lawton’s eye-lotion, a remedy for all eye diseases” which “all opticians and jewellers should keep,” and the Spencer Optical Co. has its “improved German Eye-water” from a formula of Dr. Agnew, equally as potent and all-embracing.

Such practice as this bill is intended to protect is contrary to the spirit actuating medical legislation in New York, and is inimical to the public good. Let it die.

A. A. H.

THE OPHTHALMIC RECORD

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NO. 4, NEW SERIES.

ORIGINAL ARTICLES.

A CASE OF REPARATION FROM EXTENSIVE INJURY INVOLVING THE INNER ANGLE OF THE EYELIDS*.

By **CHARLES A. OLIVER, A.M., M.D.,**

One of the Attending Surgeons to the Wills' Eye Hospital; one of the Ophthalmic Surgeons to the Philadelphia Hospital, etc.

On the 9th of December, 1896, B. F., a 27 year old boiler-maker, was referred to the Wills' Eye Hospital from the Dispensary Service of the Methodist Episcopal Hospital with the statement that the patient had applied at the Dispensary that morning upon account of "having been struck in the left eye with a piece of red-hot steel." The note stated that most of the fragments had been removed, the eye washed with boric acid solution and a few drops of cocain and atropin instilled.

The patient, who was admitted into the hospital wards by the resident surgeon, Dr. James C. Bloomfield, at 12 m., I found in bed at 3 p. m., he having had the conjunctival sac freely irrigated, atropin instilled once, and cold compresses applied continuously.

Superficial examination showed that there was a rather extensive burn of the nasal conjunctiva and two short curvilinear cuts extending partly through the upper and lower lids; the inner cul de sac of the conjunctival membrane being torn loose and protruding through the palpebral fissure.

Close inspection by the aid of a spring speculum and oblique light revealed that not only were the eyelids torn apart at the inner canthus, but that there was a deep sulcus of burnt tissue extending almost one and one-half centimeters directly back and in into the orbit. The eyeball itself was uninjured.

* Read before the February, 1897, meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia.

Two days later, whilst the patient was under the anæsthetic influence of ether and with the assistance of Dr. George C. Harlan, I removed numerous pieces of loose and adherent charred dirt from the deeper and previously unexposed portions of the wound. The opening into the sulcus was covered by carefully stitching the torn conjunctiva into position by a series of fine and delicate sutures. The free edges of the breaks in the upper and lower lids were sewed together and the inner extremities of the two lids were reunited by a deeply placed strong silk thread. The wound was dressed in the ordinary antiseptic way.

In four days time the sutures were removed. The conjunctival cul de sac to the inner side was thoroughly restored, and the lids were in proper position. The orbicularis possessed full action and the globe had free motion. The ice compresses were ordered to be used for but ten or fifteen minutes three times daily and the patient was allowed out of bed.

One week after the accident, there being but few marks of any traumatism, the patient was permitted to return to his home.

Seven weeks later, with the exception of some faint scar-tissue in the skin of the side of the nose surrounding the inner canthus and a slight double line of symblepharon which only could be recognized when the eyeball was rotated far to the left, with two almost imperceptible cicatrices extending through the two canaliculi, nothing abnormal could be noticed.

A troublesome stillicidium which is provoked only by exposure to strong draughts of wind, can, should it become more pronounced, be remedied by extirpation of the lachrymal gland.

Remarks.—The case is presented as illustrating how so gross an accident, produced in such a remarkable way, has, by prompt and judicious treatment, left but little or no disturbing sequelæ.

REPORT OF A CASE OF PERSISTENT RETINAL IMPRESSION FOLLOWING THE USE OF THE SEXTANT.

By **FREDERICK T. ROGERS, M.D.,**

Providence, R. I.

ILLUSTRATED.

Numerous cases have been reported of persistent images after looking at an eclipse or some brightly illuminated object, but they are usually of short duration. The following case is interesting from the fact that the patient, an unusually bright student, was able to graphically describe its appearance in detail, and that the image persisted practically unchanged for ten months afterwards.

E. R., aged 24, female, student in Brown University, on February 21, 1896, consulted me for a blur over the left eye, and gave the following history:

On February 11, when taking an observation of the sun with the sextant, she neglected to put up the smoked glass and, although at the time she experienced no other inconvenience than a momentary glare from looking at the sun, has had

since then a distinct image of the sun in the center of the field of the left eye. She described it to me as follows:—"On the first day that I noticed the spot I could see it as well with the eye closed as when open, but after the third or fourth day I could only see it when looking at the light or some brightly illuminated object.

"The first sensation was that of semicircles of light revolving rapidly about a darker center."

She drew the following diagram as illustrating the effect :

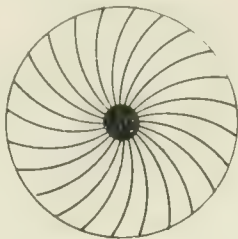


Fig. 1.

"After a few days the periphery of the image was of a purplish hue and the whole seemed in rapid motion till, as if tired of looking at it, it became hazy and blurred, with a distinct lavender-colored center and purple edge."

There was no history of previous trouble with the eyes and she seemed to think that up to this time she had as good vision as anyone and had been able to pursue her studies without inconvenience. There was no objective sign of inflammation of the eye or its appendages. The vision was :

R. V. = 0.3 with some letters in 0.4 and 0.5.

L. V. = 0.1 +.

Javal showed an astigmatism of 3.50 in the right eye and 3.0 in the left, both with the rule ; and retinoscopy, a mixed astigmatism as follows :

R. +1.50 cyl. ax. 90° \ominus 2.0 cyl. ax. 180° .

L. +1.0 cyl. ax. 90° \ominus 2.50 cyl. ax. 180° .

The ophthalmoscopic examination was made with a dilated pupil and showed a distinct red zone of 2 mm. in diameter surrounding the macula of the left eye entirely dissimilar to the appearance of the right eye, and a little below and toward the disc is a spot of brownish discoloration irregular in shape and from 5 to 6 mm. in diameter. There is no alteration in the fundus other than these and no apparent disturbance of the vessels or disc.

The use of the eyes was prohibited and scopolamin ordered to be instilled three times a day, protecting the eyes by rather dark glasses.

A few days later, while under the influence of the cycloplegic, the vision was tested as follows :

R. V. = 0.3 + 1.0 cyl. ax. 90° \ominus 2.0 cyl. ax. 180° = 1.0.

L. V. = 0.1 + + 1.0 cyl. ax. 90° \ominus 2.50 cyl. ax. 180° improves so that some letters on the ends of the lines are seen in 0.5 and 0.6, but the central letters are not seen on direct fixation.

With a dilated pupil the subjective appearance of the spot is changed. There is a distinct six-sided lavender figure as a center and, on gazing at it intently for a few seconds, a flash or point of light comes on the lower edge and extends with

quivering motion around the center till the whole becomes blurred. After closing the eyes for a moment this is repeated upon reopening them.

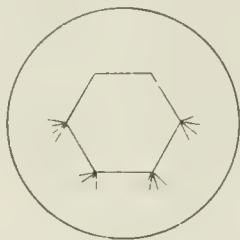


Fig 2

The field is unrestricted in the periphery with a sharp-defined central scotoma.

Without faith in the efficacy of drugs, she was placed upon increasing doses of Kal. Iodid. and, the use of the eyes being prohibited, was kept under the influence of the cycloplegic.

From this till March 24, there was no change in the ophthalmoscopic appearance save that the red zone gradually faded and the spot of discoloration disappeared. On this date, finding no change in the subjective symptoms and yielding to her importunities to allow her to resume her studies, the scopolamin was discontinued and the following glass ordered :

O. D. $+ 0.50 \text{ C} - 2.50 \text{ cyl. ax. } 180^\circ$. V. = 1.0.

O. S. $+ 0.50 \text{ C} - 1.75 \text{ cyl. ax. } 180^\circ$. V. = terminal letters in 0.5.

April 17, she reported that, while she could see much better with the glasses, she suffered severely from headaches and that the spot before the left eye, though slightly fainter, was otherwise unchanged.

October 24, the appearance of the image was the same. The headaches were, however, worse with the resumption of her studies and she believed she could read without her glasses with greater comfort, although for class room work they were quite necessary. She was allowed to discontinue their use for close work and the following ordered for distant vision :

O. D. $- 2.0 \text{ cyl. ax. } 180$.

O. S. $- 1.75 \text{ cyl. ax. } 180^\circ$.

On November 7, she reports that the headaches have ceased and that there is no change in the visual image.

Tri-State Medical Society of Iowa, Illinois, and Missouri.—The fifth annual meeting of this society occurred in St. Louis, April 6, 7, and 8, 1897. Dr. Joseph Price of Philadelphia held the Surgical Clinic, Dr. James T. Whittaker of Cincinnati the Medical Clinic, Dr. Dudley Reynolds the Ophthalmic Clinic. Dr. G. Frank Lydston of Chicago entertained the members with an original story during one of the evening sessions.

FUNCTIONAL DISEASES OF THE OPTIC NERVE AND RETINA.

By ROBERT W. MILLER, M.D.,
Los Angeles, Cal.

The ailments to which reference is made in the above title are not embraced under this head, nor grouped together in any work upon ophthalmology with which I am familiar, probably for the reason that cases are found bearing the same name, some of which are functional, others organic, and still others occupying a middle ground. The work of grouping or classifying and treating them in a paper of the length allotted me can be but very imperfectly done; yet an effort will be made to furnish a few thoughts that may not be altogether lacking in interest and practical value.

In the light of the results of modern pathological and ophthalmoscopic research, it seems that the term amaurosis, formerly used to designate blindness either partial or total from some obscure cause, ought to be discarded. Impairment or loss of vision should be used instead. Such terms as "uraemic," "amaurosis," etc., so common in text books are not sufficiently definite and may well be dispensed with.

"Amblyopia" is a convenient word used to designate subnormal acuteness of vision dependent neither upon visible organic lesion nor faulty refractive media.

In the use of the words "hemeralopia" and "nyctalopia," the former will be employed to designate day-vision and night-blindness and the latter to designate night-vision and day-blindness.

Since the eye must be regarded physiologically as the expanded prolongation of the optic nerve, we find it convenient to deal much of the time with diseases of the nerve and retina as essentially one disease.

A somewhat rare condition is *spasm of the retinal arteries*, epilepsy of the retina or megrim. In its description I cannot do better than quote from Noyes:—"In consequence of vaso-motor irritation the retinal arteries may be firmly contracted, and arrest completely the circulation. Irritation of the sympathetic in the neck, causes their contraction, while extirpation of the superior cervical ganglion induces enlargement of the vessels. The suspension of the circulation causes partial or total blindness in one or both eyes.

A so-called blind headache is a mild form of the disorder, and the vessels of the brain, as well as the eye, may be affected. The visual disturbance may be the most conspicuous phenomenon and should not

be regarded as of serious moment.' However true the last statement may be, the patient sometimes manifests not a little concern and annoyance.

I am not aware that any one has made a study of its possible pathological connection, by heredity or otherwise, with the grosser manifestations of epilepsy.

Albuminuric and diabetic amblyopias are apt to be associated with organic, cerebral and retinal change.

Again, nyctalopia, in the sense of seeing best at night, is apt to be symptomatic of hyperæmia of the retina. Its occurrence is explained by the existence of a central scotoma (or cloud). The latter in front of the eye causes its minimum of embarrassment to vision, when the light is dim and as a result the pupil larger and hence admitting a larger amount of light to fall upon the peripheral portions of the retina.

Hemeralopia or day-vision is often associated with and hence becomes a frequent symptom of pigment degeneration of the retina.

It was observed as a symptom of this disease, as we are told in pre-ophthalmoscopic days. The diagnosis was presumably made by *post-mortem*.

Hemeralopia is often dependent upon impaired nutrition, long-continued exposure to strong light, glare, climatic vicissitudes, etc. I have observed it in some patients in whose general condition I could discern little or nothing pathological, but were from a general appearance in good health.

These cases were quite the exception, most of the patients being at least the subjects of overwork or worry.

THE AMBLYOPIA OF SQUINT is an important affection which we frequently find opportunity to observe and study. It is sometimes due to imperfect development of the optic nerve and retina or the visual centers, while in other cases the explanation for the squint is to be found in an error of refraction or opacities of one or more of the refractive media.

Other functional disturbances are those due to shock, traumatism to the eye or contiguous part, anaesthesia from the inhalation of chloroform, ether, etc., certain drugs taken internally, and, as I believe, a transitory impairment of function which occasionally lowers vision in quite a perceptible degree, caused by the installation of a solution of cocain into the eye. I had one patient who asserted that he could not see to get about for ten or twelve hours after the use of a 5% solution

used to produce mydriasis, but I am persuaded that his fear and anxiety had more to do with the latter period of his impairment of sight than had the drug.

DYSCHROMATOPSIA, or difficulty in distinguishing colors, is closely allied to color-blindness, and may be either congenital or due to organic disease of the retina.

HEMIANOPIA, or loss of vision in one-half the visual field, is usually of the lateral variety and homonymous. In some of these cases zigzag flickerings in the defective part of the visual field is observed—*flitting* scotoma. Moreover, flitting scotoma is said by some authors to occur as a manifestation of megrim.

HYPERAESTHESIA of the retina, is met with tolerable frequency, and in some of its manifestations presents much of interest and importance. Under this head we find certain cases of asthenopia, migraine, scotoma scintillans, some cases of hemianopsia and hallucinations of sight.

Snow-blindness, while it usually involves the conjunctiva and cornea, giving rise to photophobia, is, so far as the immediate and positive loss of sight goes, dependent upon hyperaesthesia of the retina.

ANAESTHESIA of the retina is sometimes associated with the same cause as hyperaesthesia, and with these conditions as symptoms we find what has been termed *hysterical* anaesthesia and hyperaesthesia of the retina, and hysterical amblyopia. Hyperaesthesia is often dependent in a measure upon some refractive error, which when corrected tends to afford relief. Long-continued residence in dark, illy ventilated apartments, followed by sudden exposure to bright light, is one of its most prolific causes.

HYSTERICAL AMBLYOPIA affords another type of the hysterical manifestations. It must not be inferred that its occurrence is confined to females, as genuine cases are occasionally found in males as well.

From the standpoint of curiosity, some of these cases are rather interesting, and when one of them falls into the hands of the oculist, he is liable to wish more than once that it were some other kind of case, or that the patient had called upon some other than himself, ere his connection with it has terminated. The thought may indeed occur to him, that if he could only convert it into a case of "*fits*," and cure the latter (as the old story goes) how happy would the solution of the problem be.

We must not fail to observe that the sudden attacks of blindness due to acute gastritis, and to outbursts of glaucoma must not be mistaken for any of the varying conditions to which we have referred.

In conclusion we will consider briefly a very important, yet somewhat rare class of ailments known as the *TOXIC AMBLYOPIAS*.

Temporary blindness, partial or complete, may result from uraemic and other toxic agents in the blood, through direct action upon the optic nerve and retina.

The recent discovery of Samelsohn marks an epoch in the pathology of this class of ailments, as it sheds light on the prognosis and furnishes a basis for more rational theraphy. His discovery shows that in a very large percentage of cases of toxic amblyopia there exists an optic neuritis of that part of the nerve lying along the optic canal, and this serves to explain many of the hitherto inexplicable optic nerve changes.

I had recently under my care a man suffering from amblyopia ex-abusu. He had used both tobacco and alcoholics to excess for a number of years.

V. was reduced to $\frac{3}{80}$ in the right eye and $\frac{2}{40}$ in the left. The pupils were moderately dilated, and reacted very imperfectly to light stimulus. He manifested moderate general fatigue and seemed rather despondent. V. has improved considerably, but remains subnormal.

OCULAR PALSIES FROM INJURY.

By ALVIN A. HUBBELL, M.D.,

Buffalo N. Y.

Professor of Ophthalmology, Medical Department Niagara University,

Case of paralysis of both facial and both abducent nerves :

Henry M —, aged 23, switchman. On August 21st, 1888, while coupling cars loaded with lumber, the young man's head was caught between the ends of the lumber projecting beyond the platforms of the two cars between which he stood. He was afterwards picked up in an unconscious state and taken to the Fitch Accident Hospital. From the hospital memoranda we learn that "a scalp wound was inflicted on the left side of the head, over the occiput, and about two inches in length ; profuse hemorrhage from the ears, nose and mouth, with frequent vomiting of blood ; pulse, 54 ; respiration not disturbed." The diagnosis was, "fracture of the base of the skull."

On the following day, August 22nd, he was transferred to the Emergency Hospital, and placed under the care of Dr. C. M. Daniels, surgeon to the Erie railroad. He was, at this time, in a semi-conscious state, from which he could be

aroused with difficulty. His pulse was about 60, and temperature 90° F. (?) On the left side of the head, just above and behind the ear, there was a semi-circular wound of the scalp, of considerable extent, passing from above, downwards and backwards. The wound was said to be four inches long, although at the Fitch Accident Hospital it was noted as being two inches. The bone beneath did not seem to be fractured. The wound was sutured with catgut, and dressed anti-septically. On the right side there was slight laceration and much contusion and swelling from above the mastoid process to the clavicle, and the parts were painful and sore. There was some bleeding from both ears, and as the patient became conscious, it was found that the hearing in both was somewhat impaired, most, however, in the right, although ordinary conversation could be heard with ease. There was complete facial paralysis on both sides, every muscle of expression being perfectly immobile, the patient being unable to close the eyelids or move the lips. He could, indeed, "Laugh and cry as from behind a mask," neither smile or frown having any expression in the face. Both right and left abducent nerves (nerves supplying the external recti muscles of the eyeballs) were also completely paralyzed, producing paralytic convergent squint of both eyes. The physiognomy of the patient was thus rendered most peculiar and striking. The vision was a little "hazy" or "smoky," in both eyes, but worse in the right. In the right eye, the accommodation was also impaired and the pupil slightly dilated. The right side of the tongue was dry and rough, and there was total loss of taste, according to the statements of the patient. There was difficulty in swallowing, the muscles of deglutition (probably the palatal muscles) on the right side appearing to be most impaired in function. The patient succeeded better in the act by turning his head to the left side. Only liquids could be swallowed at first. Paralysis of any other part of the body, either of motion or sensation could not be detected.

The patient, at this time, complained of intense pain in the frontal region of the head, in the eyes, and in the face. This was paroxysmal, coming and going at short intervals.

On the next day, August 23rd, there was slight rise of temperature and increased frequency of pulse, and the parts injured, together with the face, were much swollen, and the face was also very red. The pains continued to be severe, requiring the administration of anodynes.

The subsequent history of the case is one of slow improvement. The pains gradually subsided. The patient was able to swallow semi-solid food on the third day, and soon afterwards solid food. The wounds and contusion healed rapidly. The sense of taste had fully returned within a month after the accident. Hearing improved, and the vision, together with the size and reaction of the right pupil, seemed to be normal after a few weeks. A few days after the patient was brought into the hospital, I was asked to see him, and have had occasion to examine him frequently since, and I found the condition of the eyes and ears as above noted. In addition, careful examination of the fundi of the eyes and of the membrana tympani showed no abnormal appearances whatever.

I have seen the patient recently, and the facial paralysis has so far improved that the patient can close his eyes, and in laughter there is considerable muscular movement about the mouth and nose. The left abducent nerve has nearly, or quite, regained its function, the left eye moving normally in all directions. The right abducent, however, is still partially paralyzed, and the right eye cannot,

therefore, be turned fully to the right. The hearing of the left ear is normal, while that of the right is slightly impaired. Aside from the paralysis of the facial and abducent nerves which remains, and the impaired hearing of the right ear, the patient feels as well as before the accident.

Such a combination of symptoms as appears in this case must be exceedingly rare, from whatever cause. It affords an interesting study to determine the character and the locality of the lesions that can thus coincidentally produce a bilateral paralysis of the facial and abducent nerves, and also more or less transiently affect the sense of taste, the secretions of the mouth, deglutition, the ciliary muscle and iris of one eye, and the senses of vision and hearing.

Fracture of the base of the skull, extending into the petrous portion of each temporal bone, might have been such as to cause paralysis of both facial nerves, but such an injury would, undoubtedly have also involved other structures so extensively as to terminate the life of the patient. At least, the auditory apparatus would have been so much injured as to produce total deafness. Certainly the abducent nerves could not, almost alone, have been the only structures implicated with the facial. There is no evidence that there was an external injury at or near the point of exit of the facial nerve from the cranium, especially on the left side, sufficient to produce the facial palsy; and, even if there were, the consecutive palsy of the abducent nerves could not thus be accounted for. Neither does it seem probable that a hemorrhage at the base of the brain, within the membranes, could have destroyed the function of both the facial and abducent nerves on both sides, and in their widely different courses, without seriously affecting other nerves and other functions. Nor could there have been a coincident hemorrhage in the pons Varolii or other parts in the course of the paralysed nerves on both sides, without marked paralysis elsewhere.

Where, then, could a lesion take place that would be most likely to destroy the functions of these two pairs of nerves, and at the same time cause the other symptoms? As is well known, the nuclei of several of the cranial nerves are grouped together in the medulla oblongata, beneath the floor of the fourth ventricle of the brain. In the upper part of this region, very near the median line, is the nucleus of the abducens. Just outside of this, and a little below, is the nucleus of the facial. (These nuclei were, not long ago, supposed to be one.) The fibers from the facial nucleus pass inwards and loop around the inner and upper sides of the nucleus of the abducens. Thus there is

an intimate relation between the root-fibers of the facial and the nuclei of the facial and abducens.

Therefore, a lesion — for example, a hemorrhage — occurring near the median line in this region could impinge upon or affect the nuclei and fibers of these two nerves on both sides, and very slightly or not at all, involve other structures. Granting that there was fracture of the base of the skull; granting that there was more or less hemorrhage from the meninges of the brain, yet I believe that the symptoms in this case can be most rationally accounted for on the supposition of a hemorrhage near the median line of the floor of the fourth ventricle, between and affecting the nuclei of the abducent and the nuclei or root-fibers of the facial nerves. Pressure on nuclei and fibers in near proximity could lead to the less pronounced and less persistent symptoms, such as loss of taste, impairment of vision and hearing, etc., already mentioned.

Total monocular ophthalmoplegia, externa and interna :

Charles Wolf, aged 22, presented himself to me on May 28th, 1889, with the following history : About three and one-half weeks ago while somewhat intoxicated he had a quarrel with another man, who "punched" him in the left eye with an umbrella-stick. The next day or two afterwards he was admitted to the Toronto Hospital, where he was under the treatment of Dr. G. S. Ryerson. I have received the following note from Dr. Ryerson regarding the case, dated June 6th, 1889 :

"Charles Wolf presented himself at the hospital about three weeks ago with a slight scar in the lower lid, and protrusion of eye ; lid showed a little ecchymosis ; ophthalmoscopic signs negative ; said he was quite blind ; went out in about the same state, except that the protrusion had diminished somewhat."

On examining the case I found an irregularly-shaped scar on the left lower lid about three-fourths of an inch long, and running from near the inner canthus downwards and outwards. There was no ecchymosis of skin or ball, or other evidence of a very recent injury. There was complete ptosis of the upper lid, and the eye-ball was very prominent, protruding much farther from the orbit than the right. On raising the upper lid, the pupil was found to be fully dilated, and the ball was totally immobile to voluntary efforts, the patient not being able to turn it, even to the slightest extent, in any direction. By pressure upon the ball it would recede somewhat into the orbit. Ophthalmoscopic examination of the fundus showed the media to be clear, the optic disc pale, and the vessels diminished in size. The vision was entirely lost, the brightest light being imperceptible. General sensation of the ball and of the integument of the lids and forehead of the corresponding side did not seem to be impaired.

It is quite unusual to meet with an injury which so completely paralyses every muscle within the orbit and the circular fibers of the iris and ciliary muscle, and destroys the function of the optic nerve, but does not impair the nerves of general sensation, and the sympathetic fibers, which unopposed, cause the pupil to dilate. It is

probable that the point of the umbrella-stick entered the orbit, and at its apex injured the nerves whose functions are lost, although the history of the case does not make this absolutely certain.

Upon any theory of the *modus operandi* of the injury and paralysis the case is interesting and unusual, as presenting the combined symptoms of proptosis, loss of vision, and total paralysis of all the extra- and intra-ocular muscles.

A CASE OF INJURY TO THE MOTOR-OCULI NERVE, FOLLOWED BY PARALYSIS.

By JOHN E. WEEKS, M.D.,

New York.

The peculiar nature of the lesion in the following case makes it one of exceptional interest.

Chas. W. C., twenty-three years of age, came under observation December 1st, 1896, and gave the following history: On the afternoon of November 30th, while fencing, his mask was broken by a thrust with the foil and the end of the latter, with the button attached, struck him on the face, at a point about one-half inch below the inner canthus of the right eye. Slight bleeding from a small wound followed; the pain was slight and referable to the site of the injury. There was no loss of consciousness. Within fifteen minutes after the accident Mr. C. experienced double vision; the eye became closed on account of complete ptosis shortly afterward and could be opened but very little. A physician was seen within a short time, who ordered cold applications.

St. pr. On inspecting the wound it is found that a piece of skin, measuring three by ten millimeters, is torn from the subcutaneous tissue, beginning at a point one-half inch below the inner canthus and extending downwards and outwards. The wedge-shaped flap is attached at its base. There is no swelling of the lids. Examination of all the denuded portion with a probe fails to disclose any opening into the deeper tissues. There is complete paralysis of all the muscles supplied by the motor-oculi on the side of the injury. The iris does not react to the stimulus of light or to accommodative effort. There is no paralysis of other muscles; no thermal or sensory disturbances.

Dec. 4.—Ptosis not so marked. The wearing of a shade was advised to prevent disturbances due to diplopia.

Dec. 8.—There has been but little change. Iodide of potash and biniodide of mercury in small doses were ordered.

Dec. 15.—Iris reacts very slightly to the stimulus of light. The ptosis is much less marked, and there is some power manifest in the paralyzed muscles. Strychnia, gr. $\frac{1}{50}$ *t. i. d.*, was ordered.

Dec. 25.—Improvement in the power of all the muscles is observable. Began the application of electricity, using the Faradic current. Potassium and mercury discontinued.

Jan. 13. — Still has diplopia in the left third of the field of fixation. The ptosis has disappeared ; pupil normal in size ; accommodation restored.

Jan. 19. — Muscles virtually normal in power.

Throughout the observations of this case, there has been no headache or any symptom of pain to indicate a deep-seated lesion.

We have here an example of paralysis of the muscles supplied by the motor-oculi brought about by a blow on the skin over the nasal process of the superior maxillary bone without injury to the soft tissues of the orbit. It is scarcely possible to have a hemorrhage into the tissues of the orbit which would produce paralysis of the nature described. There must have been some pressure on the trunk of the nerve itself and, since the branching of the nerve just as it enters the orbit renders it impossible to presuppose an intra-orbital lesion, we must conclude that the lesion occurred either along the intra-cranial course of the nerve or at the point where it passes into the orbit. No evidence of an intracranial lesion could be elicited. Reasoning by exclusion, we are forced to believe that the lesion occurred at the sphenoidal fissure and the sudden onset, without evidence of hemorrhage into soft tissues, makes it very probable that there was a sub-periosteal hemorrhage at the place where the nerve passes through the fissure, causing an elevation of the periosteum and pressure on the nerve affecting its superior and inferior branches. We must assume that the branching took place before the nerve reached this point, and that the tumor, thus produced, was not of sufficient size to affect other important structures in the immediate vicinity. The gradual absorption of the blood clot, permitted an almost complete restoration of the function of the nerve. Whether there was a fracture of the wing of the sphenoid at the point indicated, or whether a sub-periosteal vessel was ruptured by the force of the blow, cannot of course, be determined.

DINNER OF THE SECTION ON OPHTHALMOLOGY.

The annual dinner of the Section on Ophthalmology of the American Medical Association will take place at 7 o'clock on the evening of June 1, 1897, in the Hotel Walton. Gentlemen desiring to be present at this dinner will confer a great favor by sending their names at once to Dr. G. E. de Schweinitz, 1401 Locust Street, Philadelphia, Chairman of the Section on Ophthalmology. The subscription will be \$3.
—*Jour. A. M. A.*

A NEW OPHTHALMOSCOPE.

By JAMES THORINGTON M D ,

Adjunct Professor Diseases of the Eye, Philadelphia Polyclinic, etc.

ILLUSTRATED.

As the writer understands the idea of Helmholtz, who gave us the first ophthalmoscope, was to study the interior of the eye; yet a glance at the many scopes in the market, illustrates how the respective inventors have struggled to make this most valuable of all instruments a refractometer, and, in not a few instances have ruined it for that most important and good work it was originally intended.

To the present-day student's point of view, these "refractometers" are faulty on account of their cumbersomeness, combinations etc., often so puzzling. Now that retinoscopy is recognized as *the* exact objective method of determining the refractive condition of the eye, the ophthalmoscope will be used for its original purpose and incidentally only to measure the approximate refraction.

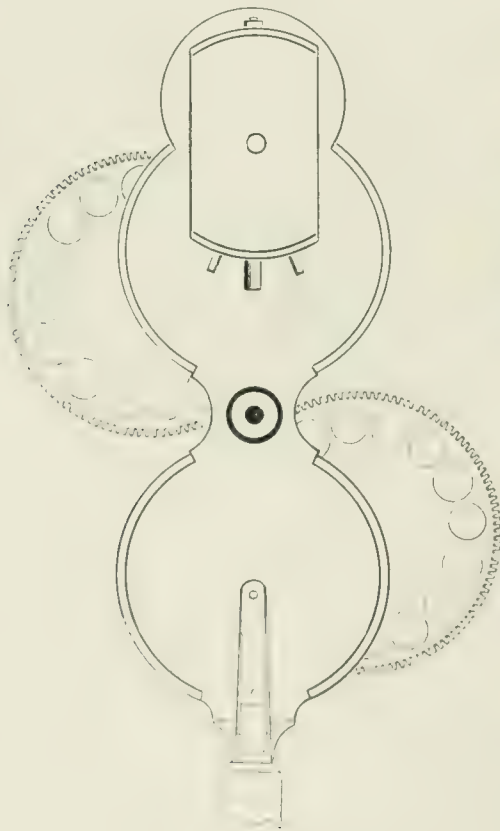


Fig. 1—Front View.
Reduced one-third.

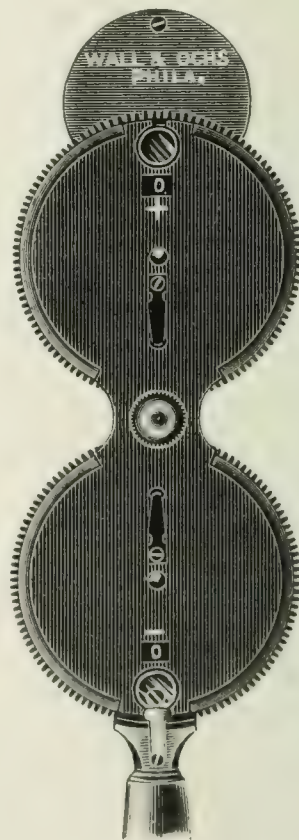


Fig. 2—Back View.
Reduced one-third.

The accompanying illustrations, (Fig. 1, front view, and Fig 2, back view) show the ophthalmoscope about to be described, reduced one-third in size.

It has two separate and distinct disks, one for plus (+) and the other for minus (—) sphericals. Each contains an aperture, and lenses of a diopter interval, from one to fifteen inclusive. *

These disks have deeply milled edges and are connected by a central pin (seen at the narrow part of the instrument) which carries beneath a small cog-wheel, so that by revolving the lower disk the upper one moves at the same time. By lateral pressure of the surgeon's thumb to the right, either disk may be turned into place as occasion may require and as shown in Fig. 1. At the juncture of the handle is a small spring which keeps the disks in position.

The plus lenses are fully sufficient to study the interior or the media of any hyperopic eye and the minus lenses answer for any myopic eye up to fifteen diopters when the indirect method would be used. The sufficiency of these lens series was estimated from 250,000 prescriptions classified by Dr. Risley and myself, which shows less than one-half of one per cent. of hyperopias over seven diopters and a very slightly higher per cent. of myopias over ten diopters.

For approximate refraction within half a diopter, this series answers every purpose and, at the same time, the accuracy of the lens cannot be questioned as it is single and not made by superimposing lenses.

The mirror of four inch focal distance and two millimeter sight-hole has been used by the writer since November, 1895, and was suggested by his retinoscope. The small sight-hole diminishes the size of the reflected corneal image, and gives a clearer view of the fundus through a small pupil, which otherwise is so difficult at times. The sight-hole, not cut through the glass but made by removing the quicksilver, gives additional reflecting surface. By removing or bringing close the original source of light, the convergence of the rays from the mirror can be regulated.

Reviewing the points of merit: —*Mirror*: (1) Short focus; (2) sight-hole small and (3) uncut; (4) corneal reflex diminished; (5) clearer view of fundus than with large sight-hole; (6) no halo in sight-hole as frequently happens when it is cut through the glass.

Lenses: (1) Their strength is single and not made by superimposing additional lenses. (2) They are easily kept clean. See

* The ophthalmologist may have the lens series arranged to suit his convenience by having the weaker plus and minus lenses placed in one disk and the stronger in the other.

Fig. 1. (3) They are changed by revolving lower disk and the surgeon's finger does not come in contact with the patient's nose or face. (4) There are no stenopaic slits, cylinders or fractions of a diopter to interfere with the value of the instrument. It is an accurate ophthalmoscope and *not* a refractometer.

To Messrs. Wall & Ochs, of this city, I am indebted for illustrations, careful attention and skilled workmanship in making this instrument.

IS THE CORNEAL REFLEX OF PRACTICAL IMPORTANCE IN THE LOCATION OF OPACITIES NEAR THE POSTERIOR POLE OF THE LENS?

By **CARL WEILAND, M.D.,**

Of Philadelphia.

In the February (1897) issue of the *OPHTHALMIC RECORD* there is an article by Dr. Jackson entitled: "The location of opacities near the posterior pole of the lens by means of the corneal reflex." Dr. Jackson looks at the corneal reflex through the hole of the ophthalmoscopic mirror, when, as he correctly states, the reflex will always be seen in the direction of the center of corneal curvature. But then he goes on to say: "As he (the observer) moves from A to B the reflex seems to move across the pupil, its rate and extent of movement being exactly what would be the rate and extent of the movement of an opacity situated at the center of curvature of the cornea. Any opacity situated in front of this would appear to move across the pupil more slowly than the corneal reflex and any opacity situated behind the center of curvature of the cornea would move across the pupil more rapidly than the reflex." But even leaving out of consideration the fact that opacities within the eyeball are viewed through a refractive medium and that they, as a consequence of this, appear to be nearer to the observer, than they really are, their localization would be possible only if the corneal reflex always appeared to us to be in the same position. This, however, is not the case. It is quite true that the line along which the observer, under these circumstances, sees the reflex always runs through the center of curvature; but the corneal reflex itself, to which alone we refer the opacities, does not lie at this center but only on the line (secondary axis) at very variable distances from the former. This will be immediately clear if we remember that the corneal reflex is produced by light from the ophthal-

moscopic mirror, apparently from a source in front of it. Calculation shows that with a concave mirror of a focal distance of 230 mm., (the source of light being about 500 mm. away from the ophthalmoscope the image of the light, or the new source of light for the corneal reflex, lies about 426 mm. in front of the mirror, as can be easily verified by experiment. It is, therefore, possible under these circumstances to throw the source of light as it were into the eye and this is the reason why, as calculation and experiments prove, the corneal reflex may lie anywhere along the principal or secondary axis in front or behind the corneal surface. Of course the corneal reflex may also be made to appear at the center of curvature and this will be the case when we arrange our flame and mirror so that the imaginary source of light in the cornea lies at this center. A practical example will make this contention clearer. We have seen that with the mirror we can produce a new light about 426 mm. in front of it, which is the light-source of the corneal reflex. If, now, one were to hold the ophthalmoscope at such a distance from the cornea that all light rays from it converge towards the center of corneal curvature, let us say, about 8 mm. behind the corneal surface, it would be the same as if one held the ophthalmoscopic mirror at 426 minus 8, *i. e.* 418 mm., from the cornea; the corneal reflex will appear exactly at the center in question. It would thus seem that, with a little modification, Dr. Jackson's purposed method might still be used. But this procedure is not practical, for a slight change in the distance of mirror and cornea produces a very rapid change in the position of the reflex. For example, if we move away only 2 mm. the reflex will lie 4 mm. *behind* the center; if 3 mm. away, 12 mm. *behind* this point; if we move away as much as 8 mm. the reflex will lie at the corneal apex itself, *i. e.* 8 mm. *in front* of the center of curvature. It is evident, therefore, that under ordinary circumstances the corneal reflex is not a practical reference-point for the location of intra-ocular opacities and it is to guard against the fallacies that might arise from the use of this method that these lines have been written.

A CASE OF CATARACT EXTRACTION UNDER DISCOURAGING CONDITIONS, BUT WITH ESPECIALLY GRATIFYING RESULTS.

By H. MOULTON, M.D.,
Of Fort Smith, Ark

The restoration of sight to the blind is always a source of joy to the patient and pleasure to the operator. But occasionally this gratification passes beyond the ordinary bounds. It was so in the present case:

A Slav, miner, aged 45, came under my care in March, 1894, and was admitted to hospital. He had a traumatic cataract of the right eye, the result of a contusion, seven years before. Three months previous to admission his left eye was ruined by a perforating wound of the cornea, received while working in a mine. This eye was the subject of chronic irido-choroiditis, was devoid even of light perception and was immediately enucleated under cocain anesthesia. Two weeks later attention was directed to the right eye. The cataract was seen to be partly fluid, with a dark nucleus, which by gravity fell into view or disappeared according to the position of the head. The anterior chamber was very deep and the iris dilated to atropin very imperfectly. Perception and projection of light were only fair. The outlook was, consequently, not very favorable and extraction was undertaken with some misgiving.

Immediately after the incision there was a copious discharge of aqueous, the cornea collapsed and the ball became very soft and flabby, rendering the subsequent steps of the operation very difficult. An iridectomy was done. Incision of the capsule allowed the fluid portion of the lens to escape leaving the nucleus behind, which, owing to the flaccid condition of the ball, could not be removed by the ordinary manipulations. It fell out of sight so deeply in the eye that I feared it had entered the vitreous, but this proved not to be the case. Failing to remove it with a spoon I introduced the iris forceps and finally seized and extracted it. The posterior capsule had remained intact. The collapsed cornea was presently restored to its place by the reaccumulation of aqueous, and the eye was bandaged.

The recovery was normal, excepting a slight iritis on the sixth day. On the twenty-first day the patient was discharged. Before the patient was discharged the tension had become normal but a multitude of dark opacities could be seen with the ophthalmoscope, freely floating around in the fluid vitreous. These, although annoying at first, were less noticed by the patient four months afterwards, although they were still visible to the examiner and in undiminished number.

I attribute the excessive flaccidity of the ball after incision to this condition which without doubt antedated the operation, and which, could it have been known, would have been enough, together with the other circumstances attending the case, to render the prognosis well nigh hopeless, and to have deterred me from operating. Yet the very satisfactory result is my excuse for reporting the case.

At the time of the patient's discharge, and four months later, vision, with +9 D. Spher., was $\frac{3}{8}$. I have not seen him since, but learned two years afterwards that he was at work again in the mines not far from Fort Smith.

CORRESPONDENCE.

TO THE EDITORS OF THE OPHTHALMIC RECORD.

In the article published in the March Issue of the OPHTHALMIC RECORD, on "The Use and Non-use of the Occlusive Bandage in Cases of Heterophoria," Dr. F. W. Marlow states that: "Dr. George T. Stevens protests against the use of the bandage in ophthalmic surgery as being not only needless but mischievous and as the promoter of heat, filth and septicism. He (Dr. Stevens) makes no reference, however, to the influence of the use or non-use of the bandage upon the effect of the tenotomy."

I wish to call attention to what has evidently been overlooked by Dr. Marlow. The question as to the importance of excluding one eye in order to determine the existence of latent heterophoria was thoroughly appreciated and distinctly noted by Dr. Geo. T. Stevens. This is very evident from the following quotation, which I take from the *Archives of Ophthal.* Vol. XVII, 1888, page 169, being one of the series of articles to which Dr. Marlow refers.

"In a certain number of cases I have been able after long-continued search, with failure to discover the real muscular balance, to find the faulty tendencies after faithfully *excluding one of the eyes* during some days or weeks. In order to be effectual the exclusion must be nearly perfect and the patient must not indulge in the occasional use of both eyes." Dr. Stevens states further: "The results of this method are to be accepted with great caution, rather as suggestive than conclusive. It is well known that it is not unusual that one eye, the vision of which is lost by disease or injury, will turn outward. This happens in so large a proportion of cases that it cannot be supposed to be in most instances the result of any original balance of the eyes outward. In like manner, after excluding an eye for one or two weeks, we may find a marked condition of exophoria, which will correct itself after the return to the use of both eyes. Notwithstanding the uncertainty of value of results obtained by the exclusion of one eye, it is a method which in a small proportion of cases has led to information which I have not been able to obtain otherwise."

JOHN T. CARPENTER, Jr.,

1419 Walnut Street, Philadelphia, Pa.

REVIEWS.

A Case of Dyslexia: A Peculiar Form of Word Blindness.—

By James Hinschelwood, M.A., M.D., F.F.P.S., Glasgow, Scotland.
From the *London Lancet*, Nov. 21, 1895, p. 1451.

This is a report of a case in Hinschelwood's practice, together with remarks and deductions. The matter and subject are both interesting, as illustrating instances, which, while perhaps of frequent occurrence, are nevertheless infrequently observed and reported.

Gould, in his "Dictionary of Medicine," defines Dyslexia as a "morbid or aphasic difficulty, or fatigue in reading," and this is probably the meaning conveyed by the expression to most minds, as the word clearly refers to difficulty in interpreting words. If this is true the term Dyslexia is incorrect in the sense used by Hinschelwood. His cases not only mean this, but much more. In his last case especially, his patient not only stumbled over words, but became generally deficient in many other respects requiring an exercise of the field of memory. The term Dyslexia in this case, indicated merely a symptom, and one might as well designate Typhoid Fever under the term "Muttering Delirium," or Descending Optic Neuritis under the word "Scotoma." The condition is a more or less general deficiency of the function of memory or comprehension, of which the inability to read words is but a mere subdivision. Hinschelwood, himself, realizes the inadequacy of the expression, for in his essay he says, in referring to Berlin's Monograph, "The term Dyslexia applied to these (Berlin's) cases by Professor Berlin, is a convenient one, and I have adopted it as describing the *prominent symptom in my case.*"

Hinschelwood quotes at considerable length Berlin's 1887 Monograph, in which he reports several cases of Dyslexia, and details verbatim his first case. The reviewer would beg to suggest that Berlin's cases were truly examples of Dyslexia; at least, in the case quoted by Hinschelwood, only the function of interpreting *words* is mentioned; while in Hinschelwood's own cases the mental dullness extends over a much wider territory, i. e., to places, objects, etc., placing Dyslexia as merely a symptom of the disease, a prominent one, may be—but still merely a symptom.

Various mental functions may be deficient. For instance, as in cases cited by Edgren of Stockholm, an individual may have lost the power of musical expression, which he calls "Amusia," or inability to

read musical notes. In other instances the power of using correct words may be lost, and is called "Aphasia," etc. Inability to read or comprehend previously understood legible words, is called "Alexia," while "Dyslexia" means great *difficulty* in reading or comprehending previously understood legible words. Equally objectionable is the expression "word blindness" coined by Kussmaul, unless it is used *specifically* to designate an alexic condition, and this only. Kussmaul claims that his expression indicates a pathological condition of a special faculty. This may be, but the reviewer is of the opinion that usually other adjacent anatomical portions of the brain are apt to be co-incidentally affected and will evidence themselves by distinct indications.

The term "mind-blindness" is a comprehensive expression, evolved by some one, but here the other extreme is reached. It is *too* comprehensive. It means too much, just as Dyslexia and Alexia signify too little. A word should be coined indicating difficulty or inability to comprehend or understand any or all visible objects.

It is difficult to separate the present report from Hinschelwood's first article on the subject, appearing in the London *Lancet* of 1895, p. 1564. They should appear together, and would jointly constitute the best literature on the subject in the English language, although some of the continental writers have written more exhaustively, especially Berlin in his brilliant Monograph. Hinschelwood's last case, reported Nov. 21, 1896, was that of a middle-aged, intemperate tailor, living in Glasgow, who, after having enjoyed the reputation and wages of an expert workman for some years, suddenly developed great difficulty in comprehending the meaning of perfectly legible words. He could see words and understand them for a moment, and then, while still able to see them, could not comprehend them. This dullness of comprehension and memory soon pervaded other phases of his life. He could not remember where he had placed his needle or thread, and spent much time in searching for these, while perhaps looking straight at them. He mismatched pieces of any garment he might be making. He could not find his way home, although surrounding objects and places were familiar to him by long association. Household objects suffered the same fate, and he seemed like a stranger in a strange land and habitation. All these symptoms became so aggravated that he finally lost his employment and was taken to the hospital, where Hinschelwood attended him. He had been for many years intemperate but latterly, becoming alarmed at symptoms of too great indulgence, had mitigated his potations. Hinschelwood insisted on *total* absti-

nence (to which he mainly attributes his cure) and placed him on arsenic and strychnia, which so benefited him that in a few weeks he was able to leave the hospital and successfully resume his trade.

Hinschelwood's first case, reported in 1895, shows the patient to have undergone much "mental worry," just preceding the inception of alexic and dyslexic symptoms. He was able to designate letters but could not combine them into words. As an exception to this, small familiar words, such as "the" were recognized as if they were only one letter. Badal explains this by saying that a short familiar word like this is perceived as a graphic unity, without the necessity of analyzing it into its constituent letters. It thus appears that in both of Hinschelwood's cases the attack was preceded by some form of cerebral irritation. This, in the opinion of the reviewer, based upon investigation of reported cases, will usually be found to be the case.

In order that vision may be complete and useful, two normal functions are necessary. First, to perceive; second, to comprehend what is seen. The first of these functions is not especially noteworthy in this instance, although amblyopia may be present and vision curtailed. But it is with the second that we have to do; the ability to comprehend what is seen. Without this the first function is bereft of most of its usefulness, at least so far as intellectuality is concerned.

The seeing or perceiving function starts in the eyeball proper, but perceiving, in its highest sense, is not accomplished here, but in the occipital portion of the brain. The reviewer quotes from Hinschelwood in describing the locality and function of perceiving and comprehending.

"The occipital lobe, especially in the neighborhood of the cuneus, and the calcarine fissure, is the center for primary visual impressions, the *perceptive center*, and in the angular convolution and its neighborhood there is a center of a higher nature, one of whose functions seems to be the storage of the visual memory of things and words, the *visual memory center*. It is evident, from what has already been said, that the functional activity of both these centers must be called into play in every conscious and intelligent exercise of vision. It is now a matter of general agreement that the primary visual center in the occipital lobe is connected with the half of the retina in each eye, the left occipital lobe with the two left halves, and the right occipital lobe with the two right halves. But since the left half of each retina corresponds to the right half of each visual field, a lesion in the left occipital lobe would produce blindness in the right halves of both

visual fields, or, in other words, a right hemianopsia. The hemianopsia is termed homonymous because it is on the same side in relation to both eyes." The same condition may of course be reversed.

Hinschelwood, with other authorities, seems agreed as to the seat of perception, but a rather hazy description is given by Hinschelwood, and others for that matter, concerning the location of the *visual memory center*, some authors even going so far as to locate it in a situation as general as the "left cerebral cortex." Matters of this kind should be stated with exactness and definiteness, always using the same word to express the same thing, especially in the same article. The reviewer would suggest, as a correct and simple expression of the location of this center as follows: the Angular convolution in the left inferior parietal lobe, and the Cuneate lobule on the mesial surface of the left occipital lobe. It is here, then, that memory is stored, commencing with the earliest impressions, and going on to old age. Memory after a time almost loses its identity as such, and we scarcely realize that the comprehension of a word, object, place or person, is in reality but the product of accumulated memories, and that the destruction of the visual memory center would blot out the power to comprehend the significance of any form of matter conveyed to the brain through the eyes. Under such circumstances, objects can be seen, because the perceptive center may not be impaired, but they cannot be understood when the visual memory center is injured.

This brings up another point. The visual memory center must be subdivided into many different departments, for we see patients suffering from the disease in question where only certain visual memory impressions are impaired, as, for instance, the power to interpret words, or figures, or places, or persons, etc. For instance, Mierzejewski reports a case where individual names and letters were known and named, but could not be united into syllables and words. Michel reports a case where a patient could read Gothic but not Latin characters. Charcot had a case where a patient, knowing French, German and other languages, lost the memory merely of the Greek and German characters. The reviewer remembers the case of a young lady, who, after a severe sickness, found herself utterly and permanently unable to remember the identity of her fiancé. People frequently seem to be more or less affected with a temporary and non-pathological paresis of the visual memory center, as, for instance, during periods of fatigue or abstraction, when a friend may be met, seen, but not recognized, or when paragraph after paragraph may be read and re-read without

being mentally comprehended. Some people have special departments of mental comprehension or memory well developed, such as memory for faces, figures, locations, etc., while others are greatly deficient in these special functions. This means natural adaptability combined with cultivation by taxation or practice of certain fibers of the visual memory center. Hinschelwood separates visual memory into two main groups. First, a group of highly specialized visual memories for the acquirement of which great mental concentration is necessary; and, second, a group of visual memories for form, color, objects and places, for the acquirement of which no great mental effort is required and which are possessed by all men who have the sense of vision. The former he claims is situated usually in the left cerebral cortex (accounting for right lateral homonymous hemianopsia which so frequently obtains in these cases) and the special high class functions are grouped anatomically, accounting for the frequent co-incident obliteration of these functions, while the more common functions grouped under the second classification are bilateral in anatomical location and their utter extermination is, therefore, more infrequent.

This review cannot be better closed than by quoting a portion of the summary of Hinschelwood's last article, in which he so graphically describes the condition of the intemperate tailor.

"Increasing knowledge of the cerebral derangements of vision, based on clinical and pathological observation, makes it clear that we must carefully distinguish between the visual perceptive center and the visual memory center. The perceptive centers, situated in the occipital lobes chiefly in the neighborhood of the Cuneus and Calcarine fissure enables us to have conscious perception of objects, as occupying a definite position in the visual fields. Derangement of this visual center is evidenced by defects in the visual fields which have all been carefully studied. But the act of vision is infinitely more complex than the simple perception of an object as occupying a particular position in the visual field. It involves complex judgments and, above all, a constant comparison of present visual impressions with the vast series of past visual impressions, the accumulated riches of our life-experience, which are stored up in a special cerebral area, the visual memory center occupying the supra-marginal and angular gyri. Derangements of this center are evidenced by the various forms of mind blindness. The objects are distinctly seen but they convey no information to the individual since they are no longer recognized by him.

Word blindness and loss of memory for places and objects are all simple varieties of mind blindness. Clinical experience and pathology teach that word blindness, or loss of the visual memory of word symbols, is due to a lesion in the visual memory center on the left side of the brain. In most cases of word blindness there is no interference with the other forms of visual memory, such as those of places, of objects, of form and color. When there is complete mind blindness involving the loss of all forms of visual memory it is probable that there is a bilateral lesion involving the center on both sides of the brain. In the present case there is nothing approaching to complete mind blindness, but the loss of memory for places and the striking failure of that necessary for his employment, in addition to the peculiar derangement of the visual memory for letters, suggest the probability of some impairment of the function of the right as well as the left center. Nor is this supposition improbable when we consider that many of the nervous disorders due to Alcoholism are bilateral, such as Amblyopia and the ocular paralyses which are sometimes met with. It is a familiar fact that while Alcoholism has a hurtful influence on the whole nervous system, its toxic influence may manifest itself by attacking specially some particular nerve or group of nerves or even some particular bundle of nerve fibers."

FRANK ALLPORT.

Is there a layer of Pigment Epithelium cells between the Choroid and Retina?—By Adolph Alt, M. D., *The American Journal of Ophthalmology*, Vol. XIV., No. 2, 1897. In commenting upon an article in Knapp's Archives by G. Lindsay Johnson, of London, entitled, "Observations on the Macula Lutea" Dr. Alt says:—

"Among the results of his (Johnson's) observations there are, however, a number which are so startlingly at variance with what has thus far been generally considered to be correct, that they necessarily arouse a renewed study in this most interesting field." He then quotes from Johnson's article as follows:—"As to the hexagonal pigment layer itself, it is permeated to such an extent with pigment, that it is excessively difficult to distinguish its structure clearly unless very thin sections be made." It seems to me that what have until now been taken for the nuclei of hexagonal cells are independent spherical corpuscles (spherules)." And further on:—"The fact that in some cases these spherules are entirely detached and float free in the field of the mic

roscope, the fact that *I never have seen hexagonal cells isolated* or even partially detached from each other along the line of the septa and lastly the fact that spaces can frequently be seen around these spherules when *in situ*, all point to their not being nuclei." Dr. Alt differs from this description on the point as "to the existence or non-existence of a hexagonal pigment cell layer consisting of distinct and separate cellular elements" and says:—"In spite of the scholarly investigations of Johnson, it seems to me that such a layer of cells does undoubtedly exist and that his spherules are after all the nuclei of these cells." He further states that, "The regularly outlined and sharply defined hexagonal pigment cells as they are usually drawn in the text books, are but rarely seen," and gives two photographs which show what is most frequently seen, "an irregular dark net work consisting of pigment granules and spiculae, varying considerably in density and depth of color, which surrounds numerous light spaces of a round or oblong shape."

He gives another photograph and says he thinks "there can be no doubt as to the fact, that this membrane consists of cell bodies of distinct individuality, and that the picture shows there is a cementing substance between these cells and that the cells may become *separated in the line of the septa*. The shape and size of the cells in this particular specimen vary greatly. Some cells are double and more the size of others, and while some have only five angles, others have seven and even eight, the majority are, however, hexagonal.

In explanation of these varying pictures and the comparative rarity of specimens which show, without any interference, the exact shapes of the cells and leave no doubt as to our really having to deal with cells, we must assume that such pictures are due to the physiological migration of the pigment into the interstices between the outer segments of the rods and cones. Naturally, different periods in this process must give different pictures. To make certain that the pigment layer is composed of individual cells with nuclei is not very feasible by simply scraping the pigment layer of the choroid. Such a procedure generally breaks up the cells and is useless.

An undoubtedly convincing proof of the fact that there is a separate pigment epithelium layer, consisting of cells of a more or less regular hexagonal shape, with a nucleus belonging to each cell, is most easily obtained by bleaching the pigment. When the bleaching has been successfully accomplished, we see in transverse sections a continuous row of separate and distinct cells, each one with a nucleus lying

sometimes closer to the retinal, sometimes to the choroidal surface of the cell. When viewing the whole layer from its retinal surface, we again see that it consists of individual cell-bodies more or less hexagonal, each with a nucleus which very frequently (almost always) does not lie in the center of the cell but in or near one of its corners. These cells are divided from each other by some cementing substance. Under such circumstances it is not difficult to isolate the cells, as the bleaching process probably destroys the cementing substance between them." One figure shows a group of such isolated, bleached and stained pigment epithelium cells scraped from the choroid with great care; another figure shows an isolated, octagonal bleached cell magnified about 1200 times which has two nuclei. He has also seen now and then a cell with three nuclei. From the foregoing Dr. Alt concludes that we have good reason to adhere to the older views and to maintain the existence between choroid and retina, of a pigment epithelium layer which consists of individual cells of an almost regularly hexagonal shape and each with a nucleus. He also refers to the pathological changes peculiar to this layer which seem to him to offer still greater and more powerful evidence against Johnson's opinion.

E. OLIVER BELT

The Austrian Government, notwithstanding the resistance of the majority of doctors, has just decided to modify the old state of things by presenting a bill which regulates the salary of the professors of a university. This bill suppresses the fees of students to professors and allots the payment of professors directly to the government. Students will not pay less, but they will pay to the government and not the professors. This is the French system. The professors who teach abstract matters and who have small audiences will profit by the change but others, and particularly professors of clinics, who have from three to four hundred students, will see their revenues considerably diminished. It is to be feared that these professors will no longer hesitate to respond to calls from German universities, and on the other hand that German professors will refuse henceforth to accept a chair in an Austrian university. The new law would be fatal to the old fame of the medical school of Vienna. — *Chicago Med. Recorder*.

REPORTS OF SOCIETIES.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held at the Chicago Athletic Association March 9 1897.

Dr. Montgomery in the chair.

Dr. Hale showed a case of congenital cataract in a young man whose right eye had been needled four times and efforts made to extract the lens substance through a large cut in the cornea. There was still left considerable lens matter directly behind the pupil which interfered greatly with vision. The cataract in the left eye had not been touched and was of a triangular form. Dr. Hale desired the opinion of the Society as to the best method of procedure with the right eye.

Dr. Gamble showed a young lady with stellate congenital cataract in each eye. They had not been operated upon.

Dr. Montgomery showed a case of Gumma of the ciliary bodies. The patient was a young man who had syphilis about a year ago, which was treated. In October, 1896, pain began in the right eye. This increased in severity, running into the temples and was accompanied by great injection. In November he was admitted to the Eye and Ear Infirmary with a severe iritis and great bulging at the sclero-corneal junction of the temporal side in the right eye. Apparently the iris had been drawn back into this bulging so that the pupillary edge was almost out of sight. The patient was put on calomel, $\frac{1}{10}$ of a grain every two hours, but the symptoms increased in spite of this. Then the bulging and iritis began in the left eye. The treatment was changed to iodid of potash and increased to 45 grains three times a day which was the saturation point. The symptoms rapidly disappeared and in two weeks the patient was without pain. The right eye, however, had a block pupil, and one week ago Dr. Montgomery had done an iridectomy on this eye.

Dr. Tilley showed a case of congenital paralysis of the third nerve. The fibers which supply the iris and ciliary muscle were not affected. This case was shown some ten years ago at the Chicago Medical Society, and since that time the only additional factor was a well determined history of syphilis in the parents. Both eyes turned strongly down-

wards and outwards, the patient being obliged to throw back and turn his head to the side in order to see with either eye. There is some myopia in both eyes and the vision of the two is about the same. The only movement is a slight downward and outward one. Dr. Tilley thought there was probably a congenital absence either of the nerve or the muscles. He was afraid to operate on the ptosis for fear that the patient could not close the eye sufficiently to cover the cornea.

Dr. Hotz reported two cases of lamellar cataract.

Case 1st, had almost normal acuity of vision and good accommodation. The patient was a young man, 23 years old, who came in April, 1896, because his eyes ached a good deal at continued near work. He was wearing concave sphero-cylinder, prescribed three years previously. With these glasses the vision of the right eye was $\frac{2}{30}$, of the left $\frac{2}{30}$. Each eye showed a hazy condition of the lens, which, after the pupils were well dilated, presented the characteristic picture of lamellar cataract. In both eyes the opaque portion showed a circular outline from which, however, numerous very short but distinct dark lines were projected in such regular intervals that the whole looked very much like a fine cog-wheel of a watch. The diameter of the opaque portion was the same in both eyes, that of the right being a little duller than the left. In the right eye the best vision obtainable was $\frac{2}{30}$ with *minus* sphero-cylinders, while in the left eye $\frac{2}{30}$ was obtained in the same way. With these glasses the patient could read Sn. 0.5, though he preferred the *minus* cylinders without the spheres.

In case 2nd, there was an unusual occurrence after the needle operation. In April of last year Dr. Hotz operated on the eyes of a four-year-old boy for lamellar cataract, the operation consisting of a small incision into the anterior capsule of the lens. No reaction followed; the pupils were kept well dilated by atrophin and the cortex became gradually opaque. A week later, in the right eye, the entire central portion of the lens (that which had originally been enclosed in the opaque lamella) was found in the anterior chamber. This same thing happened a week later in the left eye. The lens nuclei looked like very small lenses, being circular in outline, and they were absorbed in such a manner as to become gradually smaller, still preserving their shape and not breaking up. In June a needle operation, done on the capsule, left the eyes in very good condition, the fundus details being clear with a + 8 lens.

Dr. Holmes had had a similar experience of the lens nucleus falling into the anterior chamber, but it there set up so much irritation that he had to do an iridectomy.

Dr. Gradle had had a case in which the nucleus protruded through the wound in the capsule, but did not escape into the anterior chamber; it slowly absorbed in this position.

Dr. Coleman had recently had a case of a child, six months old, with marked congenital cataract in both eyes. Six months ago he had told the father (who was a physician) that he thought it would be better to operate later, but in the meantime the cataracts had disappeared. Dr. Coleman would hesitate to remove any congenital cataract except by discission.

Dr. Hale asked if anyone had ever seen the punch which he had seen described for the purpose of making a hole in an opaque capsule.

Dr. Pinckard had seen the punch, but had never seen it used. He doubted the value of it in such cases.

Dr. Hotz said that in Dr. Hale's case probably the two-hook operation would be as good as any.

Dr. Colburn had used a double needle.

Dr. Macarthur stated that the two-hook operation was still used very extensively in the London clinics.

Dr. Hotz thought that it might be wise in Dr. Tilley's case to try to raise the eyes by advancement of the superior recti. He thought that any interference with the lateral muscles might produce a troublesome diplopia.

Dr. Colburn had had a case similar to Dr. Tilley's, in which after very extensive advancements and tenotomies he had finally succeeded in getting binocular vision. He had found no trouble in securing sufficient fibrous tissue to make the advancements, although there was no apparent muscle.

Dr. Gradle stated that he had not succeeded in getting diplopia in cases of congenital paralysis and that the patients were never troubled with this symptom.

Dr. Pinckard stated that he had had a similar experience, it being impossible to provoke double vision in these cases.

C. P. PINCKARD,
Secretary.

SECTION ON OPHTHALMOLOGY.

College of Physicians, Philadelphia.

Transactions of the Section on Ophthalmology, Feb. 16, 1897. Dr. Wm. F. Norris in the chair.

Dr. de Schweinitz described a case in which *A Piece of Steel Imbedded in the Ciliary Body was Located by Means of Roentgen's Rays*. Extraction with the electro-magnet was performed after two similar operative procedures without the use of the rays had been unsuccessful. In spite of the repeated traumatisms the patient recovered with good vision. The foreign body had remained in the ciliary body for twelve days and had caused cyclitis. Dr. Max J. Stern, of the Philadelphia Polyclinic, furnished the radiograph, which clearly indicated the position of the foreign body, and which had been unrecognisable by ophthalmoscopic examination owing to the hazy condition of the media.

Discussion.—Dr. H. F. Hansell: The case just reported is the fourth in Philadelphia, and, with the exception of those of Williams of Boston and Clark of Columbus, the only ones that have thus far appeared in print. Dr. de Schweinitz is to be congratulated on the brilliant success following the extraction of the steel. The condition of the eye indicated that still further improvement of vision was to be expected. It has been thus positively demonstrated that the Roentgen ray will not only penetrate the coats of the eye and the media, but also the bones of the orbit, and that both the presence and the approximate location of a piece of metal can be positively diagnosed.

Dr. W. F. Norris: In confirmation of the last remark I will state that I have recently treated a case where Dr. Leonard has, by passing the rays through the bones of the head, demonstrated the presence of two No. 6 bird-shot in the orbit and one in the pharynx in the same patient. The Crooke's tube was held on one side of the head and the plate fastened on the opposite temple.

Dr. Wm. Thomson suggested the advisability of inserting into the conjunctival sac a strand of lead wire and the encasing of the anterior section of the ball in a lead plate as material aids in locating the precise position of the foreign body.

Dr. S. D. Risley reported a *Case of Detachment of the Retina and Choroid*.

Mr. H., aged 29, was brought to me in consultation by Dr. Leavitt, of Trenton, N. J., November, 1896. He was suffering from violent left hemicrania which originated in the left eyeball. O. D. ap-

peared healthy but was unduly sensitive to light, which caused throes of increased pain in the left eye. $V=\frac{6}{9}$. The left eye was totally blind, but the iris acted consensually with that of the right eye, both as to light and in accommodation. Two years ago, while gunning for ducks, a fellow sportsman discharged his gun, heavily charged, with its muzzle but a few inches from the left side of his head. The report deafened him, he became giddy and nauseated, and placed his hand on his left eye under the impression that it had "burst" and "was lying on his cheek." There was at first violent and distressing tinnitus, which grew slowly better for a few days, but has persisted up to the present time. There was no discharge from the ear and no evidence of a rupture of the membrana tympani. The vision in the left eye was much impaired immediately after the accident, but the eye was not painful. The vision, however, grew steadily worse until in about a year there was no longer any perception of light, although he was constantly annoyed by photopsies. Tension was subnormal, but the ball was not soft. The cornea and lens were transparent, but only a faint red reflex could be obtained through the narrow pupil. The pupil dilated well under cocaine and homatropin. No view of the optic nerve was possible, but the retinal bloodvessels could be traced far forward over a dark red undulating surface, except in the upper and inner quadrant of the ophthalmoscopic field, where they could be faintly discerned apparently in situ. The case appeared to be one of detachment of both the retina and choroid.

The accident was certainly an unusual one. I know of no other instance of detachment of the retina from concussion. The total blindness is not readily explained except upon the supposition that there was at the time of the accident a retro-bulbar hemorrhage. It is probable that extensive detachment of the choroid and retina occurred at the time of the explosion, which caused the "bursting" sensation he experienced and the immediate impairment of vision, while the increasing blindness ending in total loss of light perception at the end of a year was due to atrophy induced by the retro-bulbar hemorrhage.

Dr. W. Zentmayer reported a *Case of Anomalous Pigmentation of the Retina* in the right eye of a girl nine years of age. The personal and family history are irrelative. In the right eye scattered throughout the fundus were blackish pigment spots, some triangular, others irregular in form, of various sizes and of unequal distribution, most numerous and most closely grouped along the vessels in the inferior temporal sector. The pigment was deposited under the retinal vessels

generally in double patches, resembling gonococci, fairly uniform in width (that of a retinal vein). In the nasal and superior parts of the fundus they were larger and more scattered. Their outline was sharply defined against the adjacent healthy choroid. The papilla was of good tint and the vessels of normal caliber. In the periphery of the fundus of the left eye an insulated round pigment spot could be seen. In all save one of the cases on record the condition was nonprogressive, the function of the retina and optic nerve was normal, there was no evidence of past or present inflammation, and, in several instances, masses of pigment have been found in unusual localities in the fundus of the fellow eye. These facts support the opinion expressed by Stephenson that the condition "is a nonprogressive, congenital deposit of pigment."

Dr. W. C. Posey exhibited a *Case of Congenital Pigmentation of the Retina* similar to that presented by Dr. Zentmayer, with the exception that the clusters of pigment are grouped around one of the vascular stems of the inferior temporal retinal artery, observed in a young girl who came for glasses. After her myopic astigmatism was corrected, she had full visual acuity in both eyes. There were no other evidences of retinal or choroidal change in either eye. Although the origin of this affection is still shrouded in mystery, nevertheless the association of these pigment clusters with the vessels suggest a vascular origin for them.

Dr. G. C. Harlan reminded the Section that at one of the earlier meetings of last winter he had shown a patient illustrating a *New Method of Dealing with Cicatricial Contraction of the Orbital Tissue after Enucleation*. There were a number of cicatricial bands extending from the lids to the bottom of the conjunctival sac which obliterated the sulcus and made it absolutely impossible to wear even the smallest artificial eye. The attempt was made to form an artificial sulcus by passing a thick lead wire around the bottom of the cavity through the contracting bands and allowing it to remain in position until the walls of the sinus it had formed had completely cicatrized or "skinned over." The patient was wearing the wire at the time and continued to do so without inconvenience for six or eight weeks, when it was removed by incising the tissue in front of it and a leaden shell was inserted whose edges rested in the groove where the wire had been. Later an artificial eye was substituted for the leaden shell and has been worn since without inconvenience. Dr. Harlan has two other patients under similar treatment, one of whom was exhibited at this meeting with the wire in place.

Discussion—Dr. P. N. K. Schwenk has proposed, in order to avert the edema that so often follows the use of the leaden plates and artificial eyes, that holes shall be bored near their edges. By these means he has prevented the formation of a vacuum behind them, caused probably by the absorption of air that had been introduced at the time of insertion of the artificial eye.

Dr. S. D. Risley believes that Dr. Schwenk's theory of the causation of edema by these agents is correct. As the air behind the eye becomes absorbed, the edges of the eye press upon the conjunctival veins and produce a constant traumatic edema. In a case in which he is about to operate he proposes to insert after incision of the cicatricial bands the sphere used in the Mule's operation. The principle is the same. By substituting the convex instead of the concave shell he hopes to avoid cicatricial contraction and edema.

Dr. Schwenk exhibited, by invitation, a *New Artificial Eye* that has the advantages over those now in use in that the edges are thick and rounded, and the body is much heavier, so that it will not fracture even if exposed to considerable violence.

Dr. A. G. Thomson exhibited, by invitation, a *Case of Foreign Body in the Lens*. A weaver of 25 applied at the Wills' Hospital, service of Dr. Wm. Thomson, in January, 1897, complaining of asthenopia only. The R. eye had been convergent and amblyopic since childhood. With a cylindrical correction vision of L.—the wounded eye—was $\frac{3}{8}$, and by its use his symptoms disappeared. Tenotomy of the internus cured the squint. In February he returned complaining of the diminished vision in the L. By oblique illumination a bright reflecting foreign body was easily seen in the posterior half of the lens. It was then learned that in December, while using a hatchet on the top of a wooden box, the patient had the sensation of a foreign body impinging on the cornea, and concluded he had been struck by a piece of wood. This he thought had been removed by his physician. Vision had decreased to $\frac{3}{80}$. A small linear scar on the lower outer sector of the cornea, a similar scar on the lens capsule, and the quiescent foreign body lying in the lens substance could be seen. The lens fibers had commenced to become opaque, although in the track of the foreign body they were still clear.

The features of especial interest in this case are the freedom from all irritation and the preservation of vision for two months after the entrance of the foreign body, and the treatment to be adopted, namely, whether the foreign substance shall be extracted by the magnet

if it is a piece of metal, or whether, should it be metal or wood, the lens in its capsule be extracted.

Discussion.—Dr. Edward Jackson had searched, before the lens became as opaque as it now is, to find the path of the foreign body through the lens and had been unable to see the slightest trace of it. Opacification had developed first immediately adjacent to the anterior and posterior capsule, and even now had not penetrated into the nuclear region. He had seen cases in which opacity had formed soon after the entrance of a foreign body, and then had disappeared to reappear three or four months later. In a case of dislocated lens in spite of repeated needling the disturbed portion of the lens cleared and continued free from opacity.

Dr. Harlan considered the best treatment in the case of this patient to be the extraction of the foreign body by means of the magnet while the lens was clear, and the extraction of the lens later. A case of his own had justified these measures.

Dr. B. A. Randall suggested that the so-called foreign body might be a deposit of pigment. He had seen a number of children that showed similar opacities that closely resembled foreign bodies even to the metallic shine, but in which no history of traumatism could be obtained. The deposits were in the posterior part of the lens and occasioned no trouble.

Dr. Wm. Thomson proposed to submit the patient to the X-rays, in order to determine whether the foreign body is a piece of metal or a piece of wood. If the former, a powerful magnet could be employed to draw it forward so that it could be more readily extracted. In its present position extraction would be extremely difficult. He suggested, first, discission and removal of the anterior portion of the lens, then the introduction of the magnet, or Pagenstecher's operation for the removal of the lens in its capsule, or, better still, the extraction of the lens with the foreign body by the usual method for senile cataract.

Dr. Risley thought that if the body is metallic the X-rays would be desirable. He considers the Haab magnet dangerous on account of the liability of the body to fall into the posterior chamber, as had twice happened to him. The safest procedure would be the Pagenstecher operation after a large preliminary iridectomy.

Dr. de Schweinitz suggested the use of the Haab magnet or the method advocated by Dr. Harlan. In reference to the amblyopia we must remember that "neglected" eyes can be divided into two classes, those that have defects in the field for form and color, especially see

tomas with changes in the nerve and retina, and those that are amblyopic without anatomical changes. In the former no improvement of vision can be expected, while the vision of the latter may be improved by enforced use.

Dr. Charles A. Oliver exhibited a *Case of Reparation from Injury Involving the Inner Angle of the Eyelids* in a twenty-seven-year-old boilermaker, who was struck in the left eye with a piece of "red-hot steel." The eyelids were torn apart at the inner canthus, and there was a deep sulcus of burnt tissue extending almost one and one-half centimeters back and into the orbit. The torn conjunctiva protruded through the palpebral fissure. The eyeball was uninjured. The wound was cleansed and the parts stitched into position so as to cover the sulcus. In one week's time the wound was healed, leaving almost invisible traces of the former accident.

Dr. Edward Jackson showed a *Modification of his Binocular Magnifying Lenses* for use when operating upon the eyeball. The lenses were supported by a metal head-band such as is used for the head-mirror, but with two arms, giving a more fixed position and preventing lateral tilting. This arrangement gave a distance of three inches between the lenses and the seat of operation, and six inches or more between the eye operated upon and the eyes of the operator. He had employed it for the removal of foreign bodies from the cornea, curetting corneal ulcer, division of congenital and secondary cataracts, cataract extraction, iridectomies, etc., and in operations of this kind thought it would prove most valuable. In commencing the use of it there is need of some care not to underestimate the length of the incision or the amount of tissue removed.

HOWARD F. HANSELL,
Clerk of Section.

TWELFTH INTERNATIONAL MEDICAL CONGRESS.

Claudius H. Mastin, M.D., of Mobile, Ala., has been requested, and has consented, to serve as one of the members of the American National Committee of the Twelfth International Medical Congress to be held in Moscow Aug. 19-26, 1897. The Central (Moscow) Executive Committee consists of the following gentlemen: President, Prof. I. F. Klein; vice-president, Prof. A. J. Kojewnikow; treasurer, Prof. N. F. Filatow; Secretary-General, Prof. W. K. Roth; Secretaries, Profs. P. I. Diakonow, W. A. Tikhomirow and I. I. Hoyding; members, Profs. S. S. Korsakow, J. F. Ognow and W. D. Chorwinsky. It is officially announced that preparations are being made for the reduction of Transatlantic steamer and European railroad fares.—*Jour. A. M. A.*

WESTERN OPHTHALMOLOGICAL, OTOLOGICAL, LARYNGOLOGICAL AND RHINOLOGICAL ASSOCIATION.

Thursday, April 8th, 1897.

The President, Dr. Adolf Alt, called the Association to order.

In consequence of the unavoidable absence of Dr. Langen, Dr. F. J. Lutz welcomed the Association to St. Louis.

Dr. A. C. Corr, President Illinois State Medical Society, responded to the address of welcome.

Dr. Adolf Alt, President of the Association, delivered an address. Dr. Corr moved that a committee be appointed to take into consideration the suggestions of the President, and report at a later meeting. Seconded and carried.

The President appointed Drs. Fryer, Corr and Dayton such committee. The members present thereupon registered.

Dr. Foster, the Secretary, made his report and moved that a committee of two be appointed to draft resolutions regarding the death of Dr. W. C. Pipino. Carried. The President appointed Dr. Hoit and Dr. Tiffany.

Dr. Geo. T. Suker, of Toledo, Ohio, read a paper on **Pyramidal and Senile Cataract in One Subject.**

DISCUSSION OF PAPER.

Dr. Fryer: I want to congratulate the doctor on his very admirable paper. I think the large majority of oculists will agree with him as to the etiology, and as to the practice in bettering these unfortunate conditions. I am positive that what the doctor states in regard to the positive interference with vision is quite true, and that the proper attention has not been given by prominent men to that point. If the iridectomy is done, Mr. President, I think the majority of oculists will agree in the necessity of its being done early or we will have amblyopia, which the doctor speaks of. Then it is too late. I believe that the doctor does not state that this is always unilateral; that it is so in a number of cases. My experience is that while there is a unilateralism in degree, with vision in the fellow eye, there is a slight opacity, and if it is looked for very frequently it may be found, even if it is not enough to interfere very materially with vision. But in the majority of cases I believe that both eyes are affected, always in less degree.

Dr. J. O. Stimson, of Indianapolis: I wish to say that I am in accord with the views of this paper, and I call to mind now, two cases

in which I made operations along the lines advocated by the Doctor, notwithstanding the fact that my early teaching was contrary to this line of practice. I have in mind now a case operated on as long ago as 1878. The child at that time was a boy of some seven or eight years of age, and was brought to me as a blind child. I made an iridectomy; it was bilateral. That young man to-day holds a position as book-keeper in a prominent wholesale house; he travels everywhere, sees to do anything that anybody cares to do, and is enjoying good sight, and probably will as long as he lives. I have seen a number of these cases in the Indiana Institution for the Blind. They are sent there as blind people, and are regarded as blind people, and study the blind methods. When a patient of that kind remains in an institution for the education of the blind a number of years and learns to read by the blind method, the full advantage of the benefits to be derived from operation are not liable to be appreciated, and the friends of the patient are more or less likely to regard an operation as dangerous or risky. I cannot see for my part why an iridectomy should be attended with any more risk under ordinary circumstances in a case of that kind than it should be in any other case where it is indicated, provided the attention is right. The other case was in a person in whom I made a double iridectomy, with corresponding good results. Now of course my idea is that the iridectomy ought to be small, and it ought to be made downward, provided the cornea is clear in this neighborhood, for the simple reason that the eye will rotate and the upper palpebral margin will cover the deformity, and in that way we get a cosmetic effect which is beneficial, whereas if the iridectomy is made upward this relief of the cosmetic difficulty will not be so apparent, neither will the sight be so good. As I intimated before, I do not see why in these cases, unless there is some other lesion such as some retinal disturbance, an operation of this kind is not altogether justifiable, in fact why it should not be really recommended. So I am happy to say to the Doctor that I have been of this mind, and have acted in this way, notwithstanding my early teaching was against the operation in these cases.

Dr. Alt: I would like to say a few words on this subject. In the first place I was astonished to hear that the early teaching of those gentlemen was against the operation in these cases. My early teaching was decidedly in favor of making iridectomy—a small iridectomy—just as we do in other cataracts. Cases in my own practice as well as in the practice of others have led me to be very careful about

making iridectomy in any of these cases unless I feel perfectly certain that there will be good vision—a good result. The results in some cases that I have seen of fine iridectomies—well made operations by the best of operators—resulted in no improvement of the vision, a fact which I do not quite understand. I am satisfied in all these cases, particularly in anterior polar cataract with lenticular astigmatism, that the astigmatism has to be taken into consideration when figuring on the result and if you are not satisfied that the operation will succeed it should not be attempted; but my practice has been instead to do away with the lens and I think that the results of this operation are eminently superior to the iridectomy for optical purposes in anterior polar cataract. I have had an opportunity in quite a number of cases in the Blind School to act in this manner, and also in my private practice and I do not think I have anything to regret. But I do regret that in a number of cases in which I performed the other operation, and which promised good results, no good result was obtained, and as I now believe, not because there was some other disease in the background, but in consequence of the astigmatism which was present. That in cases of anterior polar cataract we should have astigmatism is not to be wondered at. Here we have a crystalline lens, with a cone in front of its anterior pole or near it, included in the lens capsule. And there is another point in anterior polar cataract. I do not see how iritis could produce it unless we have to deal with something inside the lens capsule and this has been termed inflammation or inflammatory process. So far as I know, I have examined three cases, there was some new form of tissue in front of the real lens tissue inside the lens capsule and in the new formed tissue there were deposits of lime. The manner in which that was formed is more guess work than anything else. When we have to deal with congenital and polar cataract, I believe it means some irregularity of development of the original lens before the anterior chamber is formed. That anterior polar cataract does not happen in consequence of lesions of the crystalline lens I know from several cases in my own practice—I know I have seen anterior polar cataract in consequence of perforation of the cornea. I think the very fact that in most cases, as far as my experience goes, anterior polar cataract is binocular and not monocular shows that we have not to deal with perforation of the cornea.

Dr. Barck of St. Louis: My views are like those of Dr. Alt. I think only in the minority of cases of iridectomy will we get good results so far as vision is concerned. Among the reasons for this is that

in all the sections around the cone there is a very irregular portion of the anterior lens capsule and only the most peripheral portions are relatively smooth. This is the explanation in the large majority of cases, and the reason why there is no improvement from the iridectomy. Still I believe that in many of these cases iridectomy may be tried first, and if the result is not such as it should be the only proper procedure would be to the removal of the entire lens by one method or another.

Dr. Alt: In answer to Dr. Barck's remark I do not think it wise to first make a iridectomy first and, if no good results, make an operation for the removal of the lens, because after the iridectomy you have a maimed eye and are not in such a favorable situation for operation.

Dr. Wheeler: The remarks of Dr. Barck and Dr. Alt have recalled to my mind a case, not of anterior pyramidal cataract, in which I was requested to operate for optical purposes. I selected the site of operation downward and inward, but before I did the operation I secured a complete dilatation of the pupil and attempted by glasses to correct any possible ametropia, and succeeded in getting vision from $\frac{2}{30}$ to $\frac{3}{30}$, and upon that promise I advised an iridectomy and performed the operation very cleanly. I got a very nice result from an optical and mechanical standpoint, but I am very sorry to state when I came to adjust lenses I failed utterly in securing any useful vision. I believe that corneal astigmatism will stand in our way of success in most of these cases. At any rate whatever is done should be done very early in the life of the child.

Dr. Colburn: My experience with iridectomy has been rather limited, but I was so unfortunate as to have failed in getting good results from the operation. I have found that needling and destroying of the lens by absorption promised and gave me the best results, so that unless I am very sure of a good result I would not perform the operation. The Doctor making the last remarks sounds the keynote of our failure in giving a correction after we have made an iridectomy. We may get a theoretical correction before; when it comes to applying glasses and getting vision, I don't think we often accomplish it. My experience is fully in favor of the needling operation. I think if it is done early we will have relief; in later life we have to make the best of a bad matter. Within the last two years I have ripened the lens, after the Förster method, and then extracted, and I have had very good results.

Dr. Frank Allport, of Minneapolis, read a paper on **Mules' Operation for Artificial Eye**. The author recited a number of cases upon whom this operation had been performed and followed by marked success. The details of the operation are as follows: First, the ocular conjunctiva is freed from the sclera, from the cornea toward the equator of the eyeball. The cornea is removed with knife and scissors, and the contents of the globe scooped out, great pains being taken to thoroughly scrape the sclera, that no choroidal or uveal remnants remained to serve as a focus for subsequent irritation. The optic papilla is also scraped down to a level with the surrounding sclera, in order to do away with the danger of irritation by pressure of the glass globe upon the delicate nerve fibers. The slightly elevated scleral border at the sclero-corneal junction should be smoothed off, when the opening may be enlarged vertically, and the edges so trimmed that they will come together nicely after the sphere has been inserted. The hemorrhage is then stopped by means of hot bichloride tampons inserted into the scleral sac. After hemorrhage has ceased iodoform tampons are packed into cavity once or twice, after which the scleral surface will be smooth and dry, and ready for the insertion of a Mules' hollow glass globe, which should be of sufficient size to communicate motion to the artificial eye to be subsequently used, but small enough to allow for inevitable inflammation, swelling and shrinking which will surely follow. The sclera is now brought together vertically over the glass globe, with five or six interrupted sutures of silk or catgut; which are allowed to permanently remain. The conjunctiva is then sutured horizontally, which sutures are either removed in about a week or allowed to come out by themselves. A dressing of iodoform and cotton, kept saturated with an aseptic, antiphlogistic lotion, consisting chiefly of lead, opium and arnica, is then applied, and the patient required to rest quietly in bed. In about a month an artificial shell may be fitted. The appearance is natural; the eye has expression and good motion; the orbital cavity is well filled out, and the annoying and repulsive lachrymation noticed after other operations is not present, owing to the juxtaposition of the artificial eyeball and the puncta.

Dr. Flavel B. Tiffany, of Kansas City, read a paper on **Skin Grafting for Malignancy of the Orbit**. Several cases were reported wherein skin grafting was resorted to as a therapeutic agent in malignant growths. The surface of the malignant parts are first scrubbed with soap and water, afterwards with a solution of bichloride of mercury, 1 to 1,000. The parts from which the

graft is to be taken are also subjected to a thorough cleansing with soap and water, and then bathed with antiseptic solution. The malignant growth is removed, its bed or seat measured, and a corresponding measurement outlined upon the arm or chest from whence the graft is to be taken, and then the graft is cut about one-third larger than the dimensions of the cavity to be filled. It is transferred without handling immediately to its new abode where it is fixed in position by a few stitches of delicate silk which has been passed through bichloride solution. The true skin is excised down to the areolar tissue, taking care not to include any adipose or connective tissue. All hemorrhage is staunched at the seat of the growth before the plant is transferred. After attaching the graft by delicate silk sutures, dry calomel powder is dusted on, covered with gauze and fastened with adhesive strips. The dressing is not disturbed for several days, when the sutures are removed. The piece soon grows red or takes on the color of the natural skin, occasionally it turns black but does not slough. In none of the cases where Dr. Tiffany has resorted to skin-grafting for cancer has there been any return of the malignancy.

Dr. Robt. M. Lapsley, of Keokuk, Iowa, read a paper on **College Instruction in Ophthalmology**, in which he described the present methods of teaching this department of medicine, and suggested that while didactic lectures should occupy an important place in the college curriculum, they should be displaced to a certain extent by recitations. Instruction should be given in the physiology and philosophy of the errors of refraction and their correction, and the use of the ophthalmoscope especially should be given more prominence, and, lastly, the student should become thoroughly familiar with clinical cases.

Keratoconus, by J. W. Bullard, M.D., of Pawnee City, Neb., is a comparatively rare disease. The reports of the Wills' Eye and Ear Hospital of Philadelphia for the years 1894 and 1895, out of a total of 26,470 cases of eye disease show only 40 cases of conical cornea. The report of the Royal London Ophthalmic Hospital, Moorfields, for 1895, shows a total of 28,474 eye cases, with only twelve cases operated upon. After a survey of the pathology, symptoms and course, it was stated that the true cause of the disease was represented by the unknown quantity whose real value had never yet been found. Every case of myopia should be carefully examined by retinoscopy for the first evidence of the disease, and if found all near work should be forbidden. Outdoor exercise, good hygiene, tonics, good food and

properly adjusted lenses should be provided. The affected eye should be carefully watched and kept under the influence of either eserine or pilocarpin, and a pressure bandage applied at night. Many operations have been devised: first, to stay the progress of the disease, second, to correct the deformity of the cornea, and, third, to establish an artificial pupil. He had recently operated on a severe case in a mildly insane young lady twenty-six years of age. The method adopted was by passing a narrow Graefe cataract knife horizontally through the apex of the cone, opening the interior chamber, grasping the upper lip of the wound with iris forceps and clipping off a piece. This was repeated in one week, the lower margin being removed. A pressure bandage was kept applied and the conjunctival sac flushed each day with boracic acid solution. When the wound was healed a one grain to the ounce solution of eserine was instilled into the eye three times a day. The result is a nearly normally covered cornea, but with a small central opacity which will necessitate an artificial pupil.

In a recent letter to the writer Prof. Snellen, of Utrecht, had described his latest treatment for conical cornea by means of black metallic plates with stenopæic slits, running from left to right and ending in the middle with a sharp point. These enable the patient to read, if the point of the slit is brought just in the visual line. Prof. S. further applied dry bandages at night, alternately on left and right eye, and in progressive cases he did a series of small sclerotomies.

Dr. W. H. Baker, of Lynchburg, Va., reports a **Case of Mental Depression Apparently the Result of a Double Graduated Tenotomy**, the patient having 4° of esophoria which was not reduced by the operation. He complained of photophobia, although there were no abnormal ophthalmoscopic signs and no inflammation about the eye. Dr. Baker questions whether it would not be better in heterophorias of low degree to resort to prisms for constant wear in spite of the fact that many eminent oculists claim that they are of very little benefit and use them only for gymnastic purposes. Should not graduated tenotomy be a *dernier* instead of a primary resort, and should the operation be done in cases of heterophoria of less than 10° ? And should not every legitimate treatment be tried in troubles of higher degree before resorting to the operation?

Extraction of Soft Cataract in each Eye of a Child under Three Years of Age, by John O. McReynolds, B. Sc., M. D., Dallas, Texas. In November, 1896, F. N., a child under three

years of age, was brought to me with both eyes blind from complete soft cataract that had existed for a period not definitely determined. His eyes had given him no pain, and there had been no history of any violent inflammation of the eyes or other serious illness, but the child was delicate and had never walked. Both pupils responded well to a mydriatic, and I decided not to perform a discission in accordance with the usual custom in such cases, but under general anaesthesia I made the operation of extraction on each eye, with an iridectomy on the right eye, and without an iridectomy on the left eye. The eyes were kept constantly bandaged for a few days, except when necessary to make the daily instillations of a mydriatic. No inflammatory trouble followed, and the child has secured useful vision, and with it the ability to walk with the aid of a chair which he pushes before him. A few remnants of the posterior capsule of each lens can be found upon ophthalmoscopic examination, but they are so situated as not to interfere with efficient transmission of light. The operation without the iridectomy, has in this instance, yielded rather the more satisfactory result, both as regards the outward appearance of the eye and the condition of the dioptric media. On account of the scanty literature on the subject I should be glad to hear the reports of similar cases from other members of the Association, in order that I may in the future profit by their experience.

J. Aloysius Mullen, M.D., Houston, Texas, presented a paper, **A Case of Inflammatory Glaucoma of Reflex Nasal Origin** in a woman forty-five years of age, who several hours before birth of her child seven years ago had an attack of severe pain in right eye, passing off after child was born. This was followed by ptosis and external squint of the same eye. Three months ago a similar attack of pain occurred in the same eye, and extending over the head. An oculist was consulted, who attempted an iridectomy for relief of the pain, but without success, as the symptoms increased in severity. On examination Dr. Mullen found plus tension, a dilated oval pupil with posterior synechiae and the lens rapidly undergoing opacification. Ptosis of right upper lid and external strabismus. The right nasal cavity showed enlarged middle turbinate, completely occluding the superior and middle meati. The removal of this hypertrophy resulted in complete cessation of pain and a return to normal tension.

A Report of Two Cases of High Myopia, with Retinal Disturbances, Treated with Subconjunctival Injections of Bichloride

of Mercury, by Francis B. Kellogg, M. D., Tacoma, Wash. The first case, a woman fifty-seven years of age, with 6.50 D. of myopia; had phosphenes and detachment of retina in left eye and phosphenes in right eye. Subconjunctival injection of bichloride (1-1000) were given once a week with marked relief of the symptoms. The solution was reduced in strength to 1-15000, which seemed to be equally effective. The left eye being blind, it was considered advisable to enucleate it on account of the sympathetic irritation in the right eye. Since that the latter has given very little trouble, the presence of the phosphenes being readily controlled by a single injection of the bichloride solution.

The second case, also a woman twenty years of age, having 9 D. of myopia and exophthalmic goitre. She had a posterior staphyloma and two small retinal hemorrhages in the macular region in the right eye; left in same condition, except the hemorrhages. She was given subconjunctival injections of bichloride (1-15000) twice a week, followed by marked improvement of vision and absorption of the hemorrhages.

A New Trial Frame, devised by J. H. McCassy, of Dayton, Ohio, was also shown.

Dr. John J. Kyle, of Marion, Ind., presented a paper, **Some Observations upon the Irritating Effects of Natural Gas upon Trachoma**, calling attention in a general way to its effect upon the conjunctiva, yet more especially to its production of trachoma. He gave the area of the belt of natural gas in Indiana, as well as its chief characteristics, namely, combustibility and chemical destructibility, and also stated the effect of the gas-charged atmosphere upon instruments and articles of use. He reported that Marion is composed of a cosmopolitan population, and that while the immigrants from Belgium, France and Germany are comparatively free from this disease, the natives seem to be very susceptible. As for example, he stated that out of twenty-five cases of trachoma reported in 1896 all were native born. The disease is mostly seen in the winter season when coal is burnt, throwing out an irritating gas. While many physicians believe it is not a contagious disease, Dr. Kyle believes in the transportation from person to person.

As to treatment, he says five things must be taken into consideration:

1. Careful attention to drainage.

2. Removal of adenoid tissue by surgical methods.
3. Cleanliness and ventilation of sleeping apartments.
4. Careful washing of conjunctiva with sol. of bichloride (1:5000), followed by application of iodine solution, with massage as an adjunct.
5. The occasional use of cupri sulph. stick.

Dr. Corr: I dislike to take part in the discussion of this paper, and I was very much in hopes that somebody else would arise quickly and discuss it. I wish to endorse the sentiments of the paper so far as the "Gas belt" irritation is concerned. But I believe the doctrine that trachoma is a disease of its own kind and can be communicated from one to another is a heresy from beginning to end. I believe it originated purely in increased irritation or in inflammation, but that in no stage is it a disease of its own kind. It is a complicated condition growing out of an anatomical condition of the parts; and a simple so-called catarrh of the conjunction, or some irritation of that kind, gives rise to anatomical conditions of pathological character which gives us the idea of trachoma. I am aware that what I am saying is in the face of almost all the authorities in this country and in England, but I have not been able to say, from the clinical facts which have come to me, that the disease is a disease of its own kind, nor do I think it is of a contagious character. And this is what has led me to say it is a heresy. I think if we take another view of it we can account for the condition. The pathology, I think, can be accounted for on a widely different theory than that it is dependent on a microbe. I think the larger part of the so-called epidemics of this trouble are due to a condition of things entirely independent of the idea that it is contagious. The doctor referred to a whole family that had it. I have seen a number of them, and the strange point was that none of them had previously had any inflammation of the lids, *but* they all reported long standing irritation of the eye as a possible cause. Possibly, however, the trouble arises from some defect of ventilation in the sleeping apartments or something of a similar nature. I had seen the disease occur in an institution where there were a number of children occupying sleeping apartments that were very small. I think we can satisfactorily account for it in this and similar ways.

Dr. Rayley: I wish to say in regard to the histology and bacteriology of trachoma, that it is really due to a diplococcus. Dr. Byron has made a number of cultures in Loomis laboratory, and after making the cultures he inoculated patients and produced trachoma. All irri-

tating vapors and powders have a tendency to make trachoma worse; any irritating kind of food, as salt meat and highly seasoned food will aggravate it. I have had a chance to find this out by sending cases, that were living in poor and badly ventilated apartments, to the hospital where they received good food and pure air and in a couple of weeks the disease had improved. To be sure they have not got well in three or four months treatment but they have greatly improved as soon as they got good food and pure air. About the treatment, this must be varied according to the condition or variety of the trachoma. In acute case, where there is a certain amount of muco-purulent discharge the best treatment is to apply a weak solution of nitrate of silver, say about five to ten grains to the ounce, then neutralize that with a salt solution. Apply that once a day and order some mild wash. We have one variety of trachoma which looks like follicular conjunctivitis, in which the granulations are very small, and the eyelids yellowish in color. For that variety the best treatment is to use tannic acid and glycerine, two drachms of the acid to the ounce of glycerine, applied once a day. Then the patient should apply to the eyes a weaker solution of ten grains to the ounce three times a day. I have succeeded in curing in three or four weeks cases of this form. In the cases where the granulations are soft and large we should use Knapp's forceps or the forceps of Dr. Noyes for the removal of the granulations. If the work is thoroughly and carefully done you will have little or no scar tissue. Another variety that is called trachoma but which is not really true trachoma, is due to a hypertrophic rhinitis in which we have a special form of granulations in the palpebral conjunctiva. For this form of the trouble the chief treatment is to remove the cause, which is the hypertrophic rhinitis.

Dr. Bulson: The diplococcus which causes this trouble no doubt exists, and so far but little progress has been made in destroying it. I have tried a method which has served me pretty well in many cases and that is the sub-mucous injection of a neutral salt solution. I have many cases in which there were repeated occurrences of the acute attacks. In that class of cases I find the sub-mucous injection or infiltration of the tissue by the neutral salt solution produces an extensive swelling of the mucosa and by painting this thoroughly with various solutions one gets a more complete effect of the medicine.

Dr. Bulson: I would like to ask Dr. Corr if I understand him to say that he does not think trachoma transmissible?

Dr. Corr: Not as trachoma.

Dr. Bulson: My experience has been so different from what the doctor says. It has been my experience that we can find what I call typical trachoma occurring directly by transmission. We have at Fort Wayne an Orphan Asylum in which there are confined 160 or 175 children. A child, dirty and filthy, with acute trachoma, was taken to that institution and not long afterwards four or five of the children (who are kept in a very cleanly condition, well fed, well clothed—the apartments light and airy) became infected with the disease. I informed the nurses that it would probably run through the school unless the utmost precaution was taken. They replied that they could not quarantine them and could not take care of them properly, as they had insufficient help. The consequence was that the trachoma did infect the school; we had 160 cases and I saw every one of them. This occurred, to my notion, directly from this one case introduced into the Asylum. I have only a few words to say in regard to the treatment. I am a strong advocate of the use of nitrate of silver, especially when there is an abundance of discharge. I use it in the strength of ten to twenty grains to the ounce, neutralizing it afterwards. I also use a solution of iodide of silver in the same manner. I think it has a less deleterious effect on the cornea than the nitrate, in fact it is said corneal ulcerations offer no objection to its use, but it serves best in acute trachoma. I consider the mixture, the formula of which was published in 1884, to be one of the best remedies that can be used, and I think ophthalmologists in general would appreciate it if they used it. It is made from two solutions, known as number one and number two, the first containing silver nitrate, glycerine and water; the second containing iodide of potassium, glycerine and water; two drops of the second solution being added to one of the first; a drachm of iodide of potassium and a drachm of nitrate of silver being used to the ounce. This produces, when mixed together, a yellowish solution. This is the solution I entrusted to the nurses of the institution I spoke of, and they used it without doing harm. The 160 cases were treated with it, and they all did well; the last of them are just recovering from it now. The epidemic began a year ago.

Dr. Knapp: I merely wish to state that it is an historical fact that after Napoleon's return from Egypt with his great army, many of the soldiers returned to their homes affected with an acute or chronic or subacute trachoma. The German physicians not understanding it, a great portion of the German Empire became affected with the disease which afterwards was known to be trachoma. This to my mind proves that the disease is transmissible.

Dr. Kyle: I have not much to say in conclusion. I think Dr. Corr is justifiable in taking the stand he does from the fact that we have not heard of the bacteriologists catching the trachoma bacillus. In the treatment there is a wide range, of course, and we must adapt the treatment to the case which seems suitable. I believe that the consensus of opinion is that the disease is transmissible.

[TO BE CONTINUED IN THE MAY NUMBER.]

At the last meeting of the Western Ophthalmological, Otological, Laryngological & Rhinological Association the following resolutions were adopted:

WHEREAS: We had heard with profound regret of the untimely death of our late confrere, Dr. W. C. Pipino at his home in Des Moines, Ia., last summer. Therefore be it resolved that our society, realizing the great loss that we have sustained, desire to express in appropriate manner our appreciation of his worth as a member of our profession and society.

Resolved: That these resolutions be engrossed upon our society record and a copy furnished the Medical Journals representing our society for publication.

J. D. C. HOIT,
FLAVEL B. TIFFANY,
Committee.

The editors of the RECORD announce that, owing to the large amount of original matter submitted for publication, it is impossible for them to guarantee the appearance of articles, however meritorious, within two or three months after their receipt. They fully expect, in the next volume, to enlarge the space devoted to original contributions. In the meantime they ask the kind indulgence of contributors.

ABOUT THE TRIP TO MOSCOW.

We would advise any of our readers who contemplate attending the August meeting of the International Medical Congress at Moscow to send for a circular descriptive of a special tour, under the auspices of a number of well known members of the profession. The excursion is managed by Messrs. Thos. Cook & Son.

A NEW KIND OF HEADACHE.

Another malady has been discovered by the faculty. It takes the form of "academy headache." This is not meant as an excuse for boys who attend seats of learning dignified with the name neglecting their lessons, but is an inconvenience which afflicts those who study high art, not high in an æsthetic sense, but high up on the walls,—skied, in fact. The credit of diagnosing this malady is due to a Sheffield oculist.

He has discovered that when, as at the Royal Academy, it is necessary to direct the eyes considerably above the horizontal line a number of times, a great strain is thrown upon the muscles which rotate the eye upward, as well as upon the elevators of the upper eyelids, which have, of course, to be correspondingly raised to accommodate the eyeball. This being so, "it is time that those who are responsible for the distribution of the pictures in galleries should recognize the fact that the human eye is not constructed for looking upward for any length of time, and if considerations of space oblige the whole of the available wall-area to be utilized, the higher pictures should be tilted at a suitable angle in order to minimize the strain on the eye-muscles.

The people who at religious meetings and at street-corners are so fond of turning up their eyes when patronizing the Creator should take warning from this discovery, even though it does come from Sheffield, and keep their orbits either fixed horizontally or turned in a downward direction. Among ladies "academy headache" may become really useful as an excuse for light refreshment.—*London Telegraph*.

THE ROENTGEN RAY.

Dr. E. Bock suggests in *Memorabilien* for February that if letters are painted on a sheet of cardboard, afterward varnished and dusted with powdered metal, or the letters are made as gold leaf is applied, the Roentgen ray will throw their shadow through the opaque cornea of the blind, and if the optic nerve is still sound, the blind person will see the shadowgraph thrown on the retina. He urges experts to experiment in this line with persons who have lost their sight from opacity of the cornea, etc., and quotes Professor Eder of Vienna, as authority for its feasibility.

THE OPHTHALMIC RECORD

A Monthly Review of the Progress of Ophthalmology.

VOL. VI.

CHICAGO, APRIL, 1897.

NO. 4. NEW SERIES.

EDITORIALS.

SUBCONJUNCTIVAL HEMORRHAGE AS A SYMPTOM OF CHRONIC NEPHRITIS.

That iritis with hyphæma, retinal hemorrhage, retinitis, or papillo-retinitis may be the first symptom which calls attention to a chronic nephritis is well-known. That subconjunctival hemorrhages, recurring spontaneously, may play the same role is equally true, although it is doubtful if they have received the place which they deserve among the ocular signs of so-called Bright's disease. Occasionally writers, for example, Talko (quoted by Knies), D. B. St. John Roosa and Frank Ring, have called attention to this matter; but more commonly text-books, both on general and special medicine, when describing nephritis are silent with reference to this symptom, although other hemorrhagic phenomena — epistaxis, purpura and retinal extravasations — are duly considered and described.

In the writer's experience these subconjunctival ecchymoses have been associated with contracted kidney and general arterio-sclerosis, and have occurred in persons past middle life and usually during sleep, the patient being surprised on waking in the morning to find a more or less extensive subconjunctival extravasation. In one case they may recur at comparatively short intervals, in another the periods between the attacks may comprise several weeks or even months.

What the relative frequency of these subconjunctival hemorrhages is, compared with the other more commonly described ocular manifestations of nephritic origin, is not apparent owing to insufficient data. According to Knies, they may be associated with retinitis albumin

urica, but in the writer's experience this association has been wanting. Perhaps, in a certain sense, they may at times replace the retinal lesions of chronic nephritis; certainly they may precede them.

If this association of Bright's disease and recurring subconjunctival hemorrhages is a matter of common observation, as, indeed, it well may be, at least the fact has not been sufficiently emphasized, and the simple rule to examine the urine carefully in each case of subconjunctival ecchymosis, occurring without evident reason, may lead to the discovery of a serious renal disorder, which, as William Osler has said, is frequently latent and even in an advanced grade may be compatible with great mental and bodily vigor.

G. E. de S.

ASTHENOPIA NOT DUE TO REFRACTIVE ERRORS.

In late years refractive errors as a frequent cause of eye discomfort and headache have occupied so prominent a place that for some ophthalmologists there seems to exist no other conditions capable of producing similar complaints. Refraction work fills their whole mind, and spectacles are their panacea for asthenopia. So great is their faith in the efficacy of the most subtle correction that a quarter dioptre more or less will in their opinion produce wonderful results and they expect a $+1.75$ will relieve asthenopic symptoms upon which a $+1.50$ previously prescribed had no influence whatever. This is no fancy but an actual fact.

The writer does not wish to belittle the importance of careful refraction work; on the contrary he himself insists upon the greatest accuracy in this work and maintains that by the painstaking minuteness observed in the adjustment of glasses we get far better results than our European confreres. But there is an unmistakable tendency to go too far and to overrate the importance of refraction work.

A visit to our post graduate schools furnishes unmistakable proofs of this tendency. The students flock around the ophthalmometer like flies around a honey-dish; that instrument seems to have a greater fascination than operations, and the test case seems to interest them more than the most important diseases. Refraction work seems to be their *alpha and omega*; the fitting of glasses, their chief object.

It is time that teachers of clinical ophthalmology should again and again impress upon their hearers the fact that asthenopic complaints are not the exclusive product of anomalous refraction.

It is time to bear in mind that mild forms of blepharitis and con-

conjunctivitis, slight disturbances of the choroid and other local conditions may cause the same discomfort in near work as slight refractive errors and deserve the same careful attention. It is time to call attention to the influence the general state of health has upon the working capacity of the eyes; that the most perfect eye cannot endure much work if its possessor is a neurasthenic or a physical bankrupt.

In fact it is time to insist that we should always act as ophthalmologists and not merely as refractionists. F. C. H.

THE OCULIST AS A SANITARY OFFICER.

In this epoch of preventive medicine, the oculist has become somewhat in evidence, especially as regards school and asylum hygiene. With this exception, since alarming epidemics of eye disease are now happily rare, little demand is made upon him in the interests of the public.

The public nevertheless requires so much instruction concerning ocular hygiene outside the school-room, and the protection of laws and ordinances to that effect, that every state and municipal board of health should include among its members one or more reputable oculists.

As an instance, the retinal and ciliary irritation caused by the Welsbach incandescent light, needs at least public expression, that it may be excluded from factories, banks, counting-rooms, residences, etc., or its chemical nature modified by transmission through tinted glasses of proper color. Builders of public and commercial buildings should be required to provide adequate window and artificial illumination, defined photometrically.

It goes without saying that the eyes of thousands of factory hands, clerks, and other employees should be examined as are those of school children, soldiers, sailors and railway men.

In short, public ocular hygiene is needed for the prevention rather of the deeper insidious affections — of retina and choroid — than for the superficial and more palpable ones. F. B. E.

OBITUARY.

Peter Dirck Keyser, A. M., M. D., formerly professor of ophthalmology and dean of the faculty of the Medico-Chirurgical College of Philadelphia, died of pneumonia, on the 9th inst., at his home, 1832 Arch Street, Philadelphia. Dr. Keyser was born in Philadelphia, Feb.

8, 1835, of German Lutheran parentage. In 1852 he was graduated from Delaware College with the degree in arts. He then especially devoted himself to chemistry working in the laboratory of Dr. F. A. Genth, city chemist of Philadelphia, for two years. He continued his studies in Germany and returned to this country in 1858. In 1861 he entered the army as captain of 91st Regt. Penn. Infantry, U. S. V., and served in the Army of the Potomac in the Chickahominy campaign. Owing to wounds and ill health, he found himself obliged to retire from active service and he resigned his commission August, 1862. He again visited Europe and 1864 received the degree of M. D. from the University of Jena, and subsequently attended the clinical instruction in the Hospitals of Berlin, Paris and London. On his return to the United States he was appointed acting assistant surgeon to the U. S. Army Hospital at Germantown, Pa. He entered upon private practice in 1865, when he finally retired from military service. He founded the Philadelphia Eye and Ear Infirmary in 1864 and delivered a series of clinical lectures to physicians upon accommodation and refraction, in 1868, and two years later began a regular series of lectures upon clinical ophthalmology. He was one of the surgeons of the Wills' Eye Hospital for a period of more than twenty years. He occupied the chair of ophthalmology in the Medico-Chirurgical College for ten years, resigning on May 7, 1893; during a great part of this period he had been the dean of the faculty. In 1889, Dr. Keyser was appointed a member of the Philadelphia Board of Health, and rendered such efficient service that he continued to hold the position up to the time of his death. The Board of Health on learning of his death, adjourned for the day and passed appropriate resolutions. The Trustees and Faculty and the Alumni Association of the Medico-Chirurgical College held special meetings and also adopted resolutions of regret and condolence. Dr. Keyser was a companion of the Loyal Legion of the United States and was one of the founders of this successful patriotic and military organization. He was a member of the American Medical Association, the Academy of Medicine, Philadelphia County Medical Society, and also honorary member of the Delaware State Medical Society. He was vice-president of the Ophthalmological Section of the Ninth International Congress in 1887 and also of the Tenth Congress in 1890. Dr. Keyser contributed a number of articles to current medical literature, relating to the disease of the eye and refraction, and was the originator of a clinical ophthalmoscope which bears his name. His wife and daughter survive him—*Journal A. M. A.*

THE OPHTHALMIC RECORD

VOL. VI.

CHICAGO, MAY, 1897.

NO. 5. NEW SERIES.

ORIGINAL ARTICLES.

A CASE OF OPTIC NERVE ATROPHY TREATED BY INHALATIONS OF NITRITE OF AMYL.

By CHARLES W. KOLLOCK, M. D.,

Charleston, S. C.

ILLUSTRATED

The following case is of interest chiefly on account of the marked improvement following treatment.

On the 10th day of July, 1896, Wm. M. White, sixty-three years of age, consulted me on account of blurring of the vision of the right eye, which, he said, had been noticed for a month and was gradually increasing. He was a strong, large-framed, muscular Scotchman and in good health. He had used tobacco constantly for many years and was a very moderate drinker of whiskey. The heart was in good condition and the blood vessels were no harder than would be expected in one of his age. Externally the eyes were normal and similar in appearance and the pupillary reflexes were good. Right V = $\frac{15}{60}$; with + 2.50 D. $\frac{15}{100}$. — Left V = $\frac{15}{60}$; with + 2 D. $\frac{15}{100}$, with + 4 D. the left read Jaeger No 1 with ease. The ophthalmoscope showed the right disk slightly hazy, a little swollen and with the veins somewhat engorged. The specific gravity of the urine, which was normal in appearance and quantity, was at the first examination 1010 but within a day or two became 1020 and has remained so. No albumen or sugar has been discovered at any time. The field of vision was concentrically contracted, but color perception was good. There was no scotoma. He was given ten grains of iodide of potash before each meal and this dose was gradually increased until he took sixty grains a day when the stomach was upset. In the meantime strychnine (sulphate) was also prescribed, beginning with one twentieth of a grain and gradually increasing until he took one-tenth of a grain three times during the day. The vision did not improve but slowly diminished until he could barely see $\frac{15}{60}$ with + 2.50 D. The disk became whiter and more distinct and the arteries

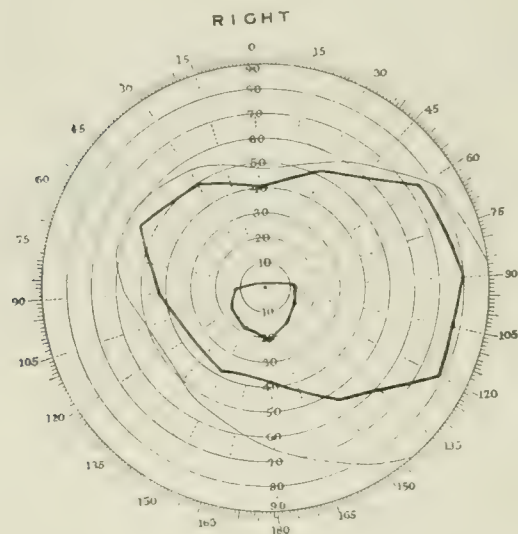


Fig. 1.

August 11, 1896.

contracted more visibly. It should be stated that tobacco and alcohol had been interdicted and given up from the first. As the vision continued to fail and the nerve to become whiter it was decided to try the effect of nitrite of amyl. On the 26th of September, more than two months after his first visit, he was allowed to inhale the vapor of a few drops of the nitrite that had been placed upon absorbent cotton. Before inhalation vision with $+2.50$, D. was $\frac{15}{60}$. The face immediately became suffused and the ophthalmoscope showed the arteries of the disk larger, while the small branches, before invisible or nearly so, were easily seen. The vision was tested within a few minutes after inhalation and found to be

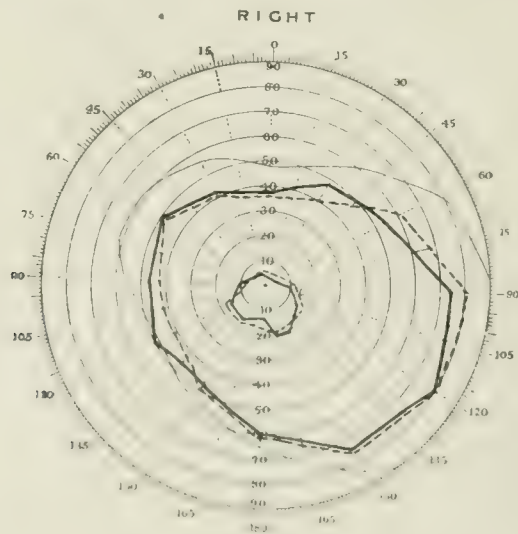


Fig. 2.

September 29th, 1896. Full black lines (white and red) taken before inhalation. Dotted lines after inhalation.

$\frac{15}{xxx}$, with difficulty. Twenty minutes later the retinal vessels had returned to their former condition, but the vision was, if anything, a trifle clearer. September 28th vision was rather better than $\frac{15}{cc}$. Four minutes after inhalation vision became $\frac{15}{L}$ to $\frac{15}{xxx}$ and ten minutes later $\frac{15}{xxx}$ (?), but did not improve beyond this.

September 29th, before inhalation one letter of $\frac{15}{xxx}$, afterwards better. 30th, before inhalation, $\frac{15}{xl}$ and $\frac{15}{xxx}$ (?), after $\frac{15}{xxx}$.

October 2nd, before inhalation: $\frac{15}{xxx}$ (?), one letter of $\frac{15}{xx}$.

The inhalations were continued daily until the heart symptoms became so disagreeable that it was thought best to discontinue them for a time and especially as the vision remained at $\frac{15}{xxx}$. He was then advised to take up the strychnine which had in the meantime been left off. The vision remains at $\frac{15}{xxx}$, the disk is white but the atrophy has not increased nor have the bloodvessels become smaller. The accompanying charts show the field taken at three different dates. There was no scotoma but a concentric narrowing of the field which did not change materially after the inhalation of the drug.



Fig. 3.

January, 1897. Taken sometime after inhalations had been given up. V= $\frac{15}{xxx}$? with + 2.50 D.

It is a well known fact that nitrite amyl causes a rapid improvement in vision in cases of tobacco poisoning, but the improvement is followed by almost as rapid diminution. This case does not seem to have been due to tobacco and alcohol (though both were used) because but one eye was affected and there was no central scotoma or red blindness. Even if tobacco and alcohol were the causes the rapid and permanent improvement after the inhalation of the nitrite of amyl, when no improvement (but gradual diminution) of vision had followed the use of iodide of potash and strychnine is exceedingly interesting.

ON SUBJECTIVE VISUAL SENSATIONS.

By PETER D. KEYSER, M. D.,

Philadelphia, Pa.

Being much interested in the article of Dr. Alex. W. Stirling on certain subjective visual sensations, read before the Section on Ophthalmology at the last meeting of the American Medical Association, and to show the correctness of the remarks of Dr. C. W. Kollock as to the cause of such sensations being in many cases indigestion or some disturbance in the digestive tract, I present a history of my own case, as well as of some patients, who consulted me on experiencing such sensations. As will be seen, my own case occurred early in life, before I had entered the profession, but was so well marked that I made notes thereof at the time and have kept them in mind ever since.

In July 1858 I went from Germany to Zurich to attend the annual Swiss Saengerfest, arriving in the evening. The next morning I went about 8 o'clock into the dining room for breakfast (or rather coffee, as at that time of the morning only coffee and bread are taken; breakfast—*dejeuner*—being eaten at 12 to 1 o'clock), and found on the table dishes of the most beautiful honey I had ever seen, and so tempting that I ate thereof with the bread and butter as I drank my coffee. After which I went out to see the arrival of the singing societies.

At about 9:30 to 10 o'clock a singular appearance came over my vision: every body and thing was divided vertically, so that but one half of the object was really seen. The right side of the person or object looked clear and distinct, while that of the left was very indistinct, as in shadow and distant. The line of demarcation was so marked that the left or indistinct side appeared cut off and thrown back like a second likeness of a ghostly vision. There were no discolorations or colored lines or rays. Soon after the development of the hemiopia the eye balls began to ache and there came a severe pain on the top of the head under each parietal bone, about at the line of attachment to the frontal, having the feeling as if a blow from a hammer or hard object had been received at each spot.

I called the attention of my brother who was with me, to the fact of these sensations and my suffering and concluded that I was bilious, and as I could not go around any more, went to a pharmacy, took some anti-bilious pills and then returned to my room in the hotel, where sleep was enjoyed for two or three hours. On awaking my vision and eyes were all right, but there was still some soreness in

the top of the head which passed away by evening. The next morning honey was again eaten with the bread and coffee, and an attack exactly like the previous day came on at about the same time, and I was obliged to sleep it off. I now came to the conclusion that it was the honey that caused the trouble, so on the next day ate none and there was no return of either visual disturbance or pain. To be certain it was the honey it was again eaten on the fourth day and again the same attack occurred at the same lapse of time after the meal. From that time on honey was not tasted and no trouble took place until one year after I thoughtlessly ate some and the very same symptoms came on in the usual time. Remembering the experience in Zurich, no more was eaten until two years after while at home in Philadelphia in my father's house, honey was eaten on hot cakes in the evening, and an attack of the same character and symptoms came on in about the same space of time, compelling me to go to bed and give up an engagement made for that evening. Since that time honey or anything with honey in it has been completely eschewed and there has never been another attack or any symptom in any way resembling it.

I did not know enough about ophthalmology at that time to have my eyes examined as to any action on the pupils, but remember my mother saying at the last attack, "Why, how large your pupils are." At that time the study of ophthalmology was so unknown either by the profession or the laity that nothing was thought of this pupillary appearance. In all of these attacks the right field in both eyes was affected alike, and at no time was there any nausea felt.

January, 1876, a relative of mine, Mr. W., called to consult me about a visual disturbance he had had the previous day. About an hour after he had eaten his breakfast he appeared to lose his vision. There was a cloud over everything and persons seemed to be off at a great distance. The lower part of an object was less visible than the upper. This lasted for about fifteen or twenty minutes when a severe attack of pain came in the stomach, almost doubling him up. Being at home at the time he took some hot water and whiskey which relieved him in a short while. After a sleep of an hour he awoke all right with his vision in its normal condition. On my inquiry as to what he had eaten at breakfast, I found that honey had been taken on some cakes. I informed him that the honey had disagreed with him, and he then remembered that when a boy it always gave him cramp colic. At the time of his coming to my office there was

nothing abnormal in the eyes, and the ophthalmoscope showed a normal fundus.

April 27th, 1882, Mrs. C., aet. 30, was brought to me at 2 P. M. with a history that about twenty minutes previously a peculiar dimness of vision had come over her. She said that there appeared a point or spot of blindness before each eye, while around the spot nothing was sharp and well defined as usual. The left half of the object was more distinct than the right. The ophthalmoscopic examination showed a perfectly normal fundus. The pupils were somewhat dilated and sluggish in action on stimulation by light. On looking at a card of 1 meter sized letters, she could make out the words on the left half of the card while the right was indistinct and with an oval blind spot in the upper and outer part. On examination of the eyes singly the same field was found. The lady was in perfect health and could give no reason or cause for the disturbance in vision. On questioning her as to what she had eaten for dinner, she told me nothing but roasted fresh pork and ordinary vegetables. I supposed it was the pork as there are many persons who can not eat such meat when cooked in a fresh state, and ordered her a brisk saline purge. By the next day she was all right again. The following week to test the fact I got her to eat some roast fresh pork again, which caused another similar attack, thus showing that the visual disturbance arose from indigestion.

My attention was again called to a case of subjective visual sensations in a female, aet. 24, which was found to be caused by eating fish, but as it was of the same character and symptoms as the above, I merely mention it.

Keeping these cases in view it shows the necessity of carefully examining into the diet and digestion of many cases of subjective visual sensations before a diagnosis of a brain lesion is thought of. The latter disease being of so much more serious character that great care should be taken before the announcement of such a diagnosis.

EXAMINATIONS BY THE TROPOMETER AND SOME OF THE PHENOMENA OBSERVED.

By **GEORGE T. STEVENS, M. D.,**

New York.

The daily use of the tropometer for more than two years has brought into strong light some interesting and important facts which could not have been clearly understood during the earlier period of these observations. Many of these extend into the field of physiology and even of anthropology and craniology and lead to new and practical views in each of these lines of science.

It is not, however, my purpose in this short article to introduce any discussion beyond an effort to place in a more concise and connected form than I have previously done the methods of examination by the tropometer and the meaning of some of the phenomena observed. The tropometer is designed to measure the various rotations of the eyes about the point known as the "center of rotation". While such measurements can be determined in every direction, vertical, horizontal or oblique, experience has shown that by far the most significant, in a great majority of cases, are the determinations of the rotations in the vertical direction. This is in distinct variance with the formerly, and still generally, prevailing thought, that the question of restriction or of excess of rotations of the eyes is confined almost exclusively to the movements in the lateral directions.

Without entering upon any discussion of the point I shall proceed upon the proposition that, in general, the upward rotation affords the key to the other excursions and that it is therefore the center of interest in examinations of ocular movements about the center of rotation.

In order to arrive at results which can be regarded as valuable the strictest observance of certain conditions is peremptorily demanded and I trust that I may be pardoned if, in stating these conditions, I am obliged to go over some ground which has been already traversed. It will be necessary here to state in definite terms some of the procedures in examinations by the tropometer which have heretofore been suggested much less in detail.

Among the conditions essential in examining the various excursions are: the position of the head and its immobility; the adjustment of the instrument at the proper distance from the eye; its exact focus at that distance, and the necessary effort of the will on the part of the person under examination, to bring out the full and complete action of the muscles in the given direction.

In order to adjust the head in the required position and to maintain that adjustment during an examination, it is necessary that the instrument be placed neither too high nor too low. As those who are to be examined are not of the same height, either the tropometer should rest upon a table the height of which can be easily modified or it should be placed upon a rather high table and an adjustable stool, resembling the ordinary piano stool should be employed.

To adjust the position of the head: The tropometer is furnished with a head rest, connected with which are certain accessories (See Fig. 1).

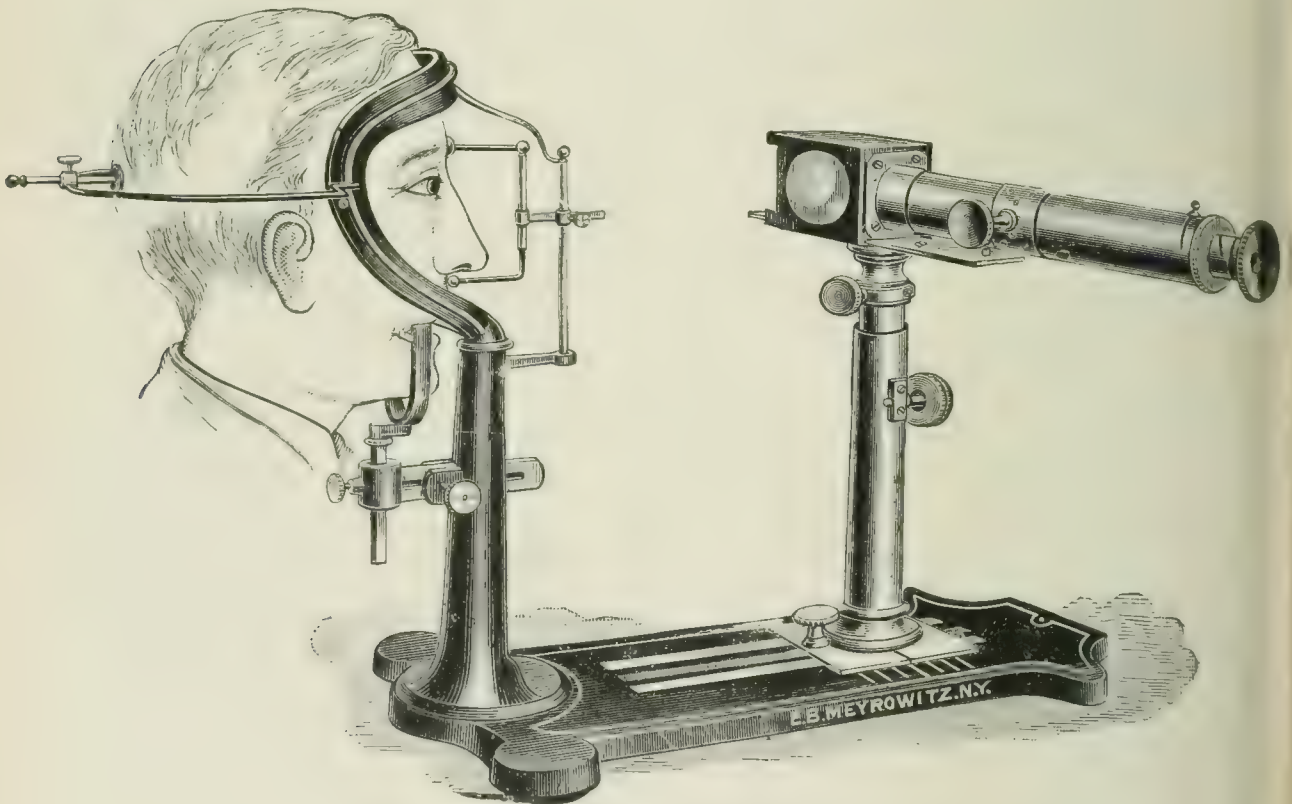


Fig. 1.

These are an exchangeable tooth rest and two buttons attached to a movable frame, the buttons being always situated in a vertical line relatively each to the other. The tooth rest is of wood, designed to be used but once and then destroyed. It slips into a bronze stirrup which is movable up and down, forward and back. The buttons can also be moved in these directions.

The person, the rotation of whose eyes is to be examined, seizes the strip of wood firmly between the teeth, the forehead is made to

press against the arc of the head rest and the frame work carrying the two buttons is brought forward until the upper button is pressed firmly against the elevation of bone which is found between the two superciliary ridges. By the back and forward action of the stirrup carrying the tooth rest the chin is now advanced or withdrawn until the lower button presses against the lip at the depression in the upper jaw just below the nose and above the roots of the teeth. The lower part of the face should be made to advance until the button presses against the lip to the extent of making the least practical difference between the distances from the two buttons to the bone beneath the skin. This demands very firm pressure of the lower button against the lip.

The head being thus brought into position, the telescope of the instrument is brought to the proper height and an approximate focus upon the cornea is arranged. Then the telescope is to be moved backward and forward, if required, until the cornea exactly fills the space between the heavy lines of the scale (Fig. 2). This can be best accomplished by turning the scale so that its main lines run vertically,

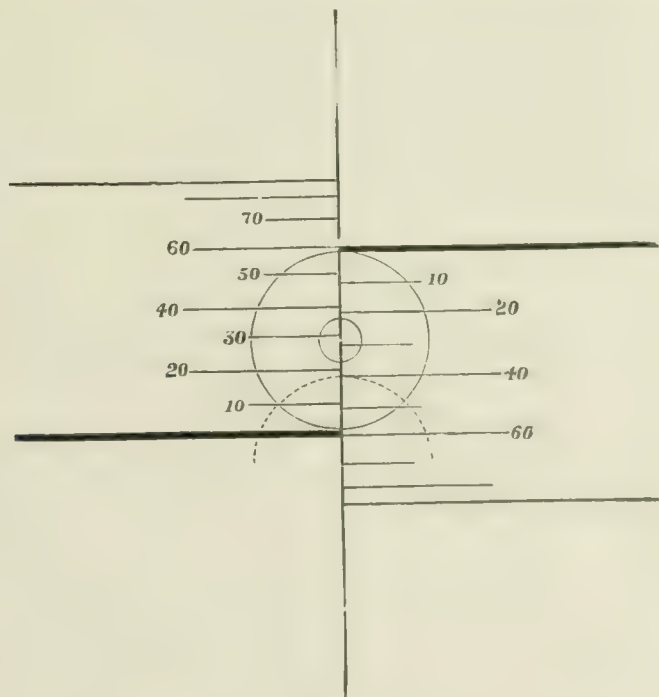


Fig. 2.

when it will be easy to adjust for the horizontal diameter of the cornea. While it is true that the horizontal and vertical meridians of the cornea

* The dotted line in the figure shows a position of the cornea as seen on the scale when the upward rotation is tested. In this case the upward (apparently downward) rotation is exactly at 40° of the scale.

are not always the same, especially in cases of astigmatism, this adjustment of the distance will, in the great majority of cases, be sufficiently accurate. The eye piece is to be turned until the scale is clearly seen and a renewal of the focusing of the telescope is made.

If it is proposed first to examine the rotation of the eye upwards, the scale is turned to permit the lines to run horizontally. The operator, with the thumb of the left hand on the upright branch of the head rest and the fingers of that hand pressed firmly against the back of the head of the observed, both for the prevention of any movement and for its detection if it occurs, uses the tip of the index finger of the right hand to depress very slightly the lower lid of the eye to be examined.

The lower (apparently upper) strong line of the scale is then, by means of the lifting screw, made to coincide exactly with the lower (apparently upper) border of the cornea while the examined eye is directed toward the small object in the center of the objective end of the telescope. Then, while the head is held in perfect immobility, the observed is directed to look upwards with all his force. To the beginner the movement may not be at first as free as possible but several repetitions will generally result in an effort which is approximately the limit.

As the eye moves up (apparently down) the observer reads on the scale the extent through which the border of the cornea passes (See Fig. 2).

In examining the downward rotation it is usually necessary to hold the upper lid slightly up by the end of the thumb, taking care to bring no pressure on the eye and to cause no resistance to its free movements.

In the lateral rotations it is essential to know that the median line of the head is at right angles to the direction of the telescope. To this end the teeth are fixed as nearly as possible midway between the upright branches of the stirrup, then the large adjustable hoop is attached to the head rest and the button is made to press against the scalp exactly over the apex of the occipital protuberance. (When this is absent the examiner must locate the central point to the best of his judgment.) Care is to be observed that this adjustment is not changed during the examination of lateral rotations.

The results of very careful observations have shown that the ability for upward rotation, in the exact vertical direction, of about 33° on the scale of the tropometer is the most favorable rotation in that direction and that the downward rotation corresponding is 50° . As

has been already remarked of all the movements the upward rotation is the key and a variation from the standard is most significant.

In the lateral directions, a nasal rotation of 50° and an outward rotation of nearly the same extent may be regarded as the most favorable conditions, notwithstanding which, with excursions in and out of this extent, there may exist pronounced converging strabismus.

A rotation upward of 33° and downward of 50° may be considered, in distinction from the conditions Anophoria and Katophoria* as being a state of *Euphoria*. This condition of Euphoria is quite exceptional, nearly all eyes rotating up more than 38° degrees or less than 30° . The most favorable point is rarely reached. In many cases of Katophoria, even after several days of practice and with the best efforts on the part of the subject of the condition, the upward rotation will fall below 22° and in extreme cases even considerably below this, and downward rotation will be correspondingly increased.

On the other hand, in people with tall round heads and low facial angles the upward rotation is in a large proportion of cases not less than 40° , and in cases of converging strabismus it often reaches 50° to 55° with a corresponding restriction of the downward rotation.

As a general rule, where the rotations of the two eyes are equal in the vertical direction and where no hyperphoria is found by the phorometer, there is with katophoria an excess of downward rotation and with anophoria a restriction closely corresponding to the deficiency or the excess of the upward movements.

There is, however, a small class of cases, a class which examinations extended more widely among different classes of subjects may increase in its proportion to the classes already mentioned, in which both the upward and downward rotations are about equally restricted. The discussion of these cases is reserved for another connection. There is still another class in which the total excursion exceeds 83 and is excessive in the upward direction and also either excessive or not deficient downward. I have found hyperphoria associated with all the cases of this class which I have examined.

In unequal rotations vertically there is often a corresponding inequality in the lateral rotations. This latter inequality is not neces-

*Anophoria, a tending of both visual lines to rise above the plane of the horizon when the head is in the primary position.

Anotropia, a deviation of both visual lines in the same direction which can be seen when either eye is covered and the other is directed in the plane of the horizon.

Katophoria, a tending of both visual lines to fall below the plane of the horizon when the head is in the primary position.

Katotropia, a deviation of the visual lines in the same direction.

sarily due to any disproportion in the laterally acting muscles, since from the very mechanism of the muscles, if there is a disproportion in the tensions of the vertically acting muscles of the two eyes, the inward and outward rotations will be affected. This is not a hypothetical statement only, it is easy to observe the effects of such unequal tensions of the vertically acting muscles. For example, a pronounced diverging strabismus may be quickly converted into as conspicuous a converging strabismus by an advancement of a superior or an inferior rectus, and this with a restriction of a lateral movement which was before excessive.

Also, if the upward rotations, though equal, are quite excessive, with a corresponding restriction of the opposite movement, or if the downward rotations are too great while the upward are too small, in the act of directing the eyes in the horizontal plane there may be a strong tendency of the visual lines to deviate laterally and thus, for example, the inward rotations may be much in excess of those toward the temples; and again this does not depend on a normally faulty condition of the converging muscles but upon the tendency of the eyes to turn to the nasal side independently of any disproportionate influence of the converging muscles and upon a restriction of the outward movement solely due to the tension of the vertically acting muscles.

Even to this rule there are occasional exceptions, for, as it is known that the insertion of the tendons of the eye muscles into the surface of the eye ball is not always uniform, that the insertion of the vertically acting muscles, for example, is in exceptional cases placed more nearly to correspond with the central sagittal meridian of the eye than usual and that in extremely exceptional cases the greater part of the insertion line of these same tendons may be on the outside of that meridian, it will be seen that the mechanical rules which would govern in the ordinary insertions must fail in these rare exceptional instances.

Notwithstanding the greater excursions of the eyes in the horizontal than in the vertical directions, the variations from a given standard of rotations are greatest in the vertical direction.

Even in converging or diverging strabismus the departure from the standard of rotations in and out are generally, almost invariably, less than the departure in the same cases from the standard of upward and downward rotations. Thus, it may happen that in a case of conspicuous converging squint the lateral rotations may be changed from 50° in and 50° out to 60° in and 45° out. Only in extreme cases is

there, as a rule, a greater change than this. Yet in the same case the upward rotation may exceed the standard of 33° by 15° or more. And what is of great practical importance in this connection is that if the tension of the elevator muscles is so far relaxed as to reduce the combined tension of the elevator and depressor muscles to a degree approximating the proper standard, the inward rotations of the eyes become notably less and the outer excursion is equally increased. It thus appears that even in marked converging squint there may be no disproportion between the rotating ability of the laterally acting muscles and that the variation of the excursions from the standard may arise largely if not wholly from the influence of the vertically acting forces

A WORD OF CAUTION AS TO THE SHAPE OF THE PRESBY-
OPIC SEGMENT IN CEMENT BIFOCAL
LENSES.

By GEORGE M. GOULD, M. D.,
Of Philadelphia.

A patient, for whom I lately prescribed bifocal lenses of the kind I suggested in the *Medical and Surgical Reporter* of Nov. 3, 1888, wrote me from a distant city that his lenses produced double vision and he could not wear them. After much correspondence and investigation the explanation of the mystery was found to consist in the fact that the optician had cemented one segment the wrong edge up. The occasion for this note consists in the fact that this error of the optician could not have happened if the curves of the edges of the wafer had not been uniform with that of the inferior border of the distant lens. Such a curve moreover makes a wider presbyopic segment than is necessary or advisable and if opticians are instructed always to cut the segment narrower, or sharper in curvature than the border of the distant lens, such bothersome accidents as the foregoing may be avoided.

CORRESPONDENCE.

TO THE EDITORS OF THE RECORD.

Under the head of "Reports of Societies," page 209 in the April issue of the OPTHALMIC RECORD, directly over the remarks by Dr. "Rayley," whose name should be written Reyling, you attribute remarks made by me, concerning the infiltration of the palpebral conjunctiva by neutral salt solution, to Dr. Bulson. The use of the neutral salt solution in this class of cases, so far as I am aware, is original with myself. I listened to the discussion from start to finish and no other speaker present alluded to this method of treatment. The stenographer has made an error and you have copied it.

Yours very truly,

K. K. WHEELLOCK.

[The misstatement, of which Dr. Wheelock very properly complains, must, with many others, be credited to the confused report furnished us by the official stenographer of the Western Ophthalmological, Otological, Laryngological and Rhinological Association. We have done our best to correct obvious errors but, doubtless, others have escaped us. We make this explanation mainly because we endeavored, a month before the meeting, to obtain abstracts of papers so that the discussion might be correctly published with them and at an early date. Had there been time we would have submitted a copy of the report to each speaker.]

We hope to have a special reporter at the next meeting of the Association, when these annoying mistakes will not occur. In the meantime we beg the indulgence of the members of the Association.—

T. A. W.

Boston, April 9, 1897.

TO THE EDITORS OF THE RECORD.

Our attention has been called to a statement in the March number of the OPTHALMIC RECORD, page 162, which reads "already the Globe Optical Co. has its Dr. Lawton's eye-lotion" etc. We wish you would correct the misstatement. The Globe Optical Co. does not advertise or make any eye-lotion. The manufacturer does his own printing and advertising, placing his article on sale at our store,

consigning to us. We are merely an optical *depot* and can hardly be held responsible for what the public asks for. We are constantly aiming to improve the business and its mode of conduct, hoping for the use of better goods and hoping to see greater intelligence shown from year to year. We are not at all in the retail business, doing work for both oculist and optician and, as a corporation, are in no way concerned in the controversy going on between them. We wish you would correct the wrong impression conveyed by the article referred to.

Respectfully yours,

GLOBE OPTICAL CO.

J. W. Sanborn, Treas.

THE INDUBITABLE VALUE OF CAREFUL REFRACTION.

TO THE EDITORS OF THE RECORD.

After reading the editorial in the RECORD, April, 1897, entitled "Asthenopia Not Due to Refractive Errors," I fail to see its *raison d'être*.

In the first place it simply reiterates what every recent advocate of careful refraction has not only admitted, but persistently urged—the intimate relation of general health with asthenopia. Temporary abstinence from near work, constitutional treatment, good food, hygienic surroundings and out-door life are always considered important adjuncts in the treatment of asthenopia. However, the writer has only stated that asthenopia may *result* from neurasthenia and general ill-health. Either inadvertently or intentionally, he omits to state the important converse of his proposition; namely, that neurotic and constitutional debility is very often markedly due to asthenopia resulting from uncorrected ametropia; and in such cases, that glasses prescribed by a careful refractionist are followed by progressive and permanent improvement in the general health.

Again, we are asked to bear in mind that mild forms of blepharitis, conjunctivitis, and other local conditions may cause the same discomfort in near-work as slight refractive errors; yet, not one word is said of the universally acknowledged influence of uncorrected ametropia in the causation of chronic local ocular disturbances. It is the experience of careful "refracting" oculists with whom I have talked, that many obstinate cases of blepharitis, conjunctivitis, etc., have yielded promptly to proper glasses. It has been the great error of ophthalmology to go blindly treating such conditions with antiseptic

and astringent lotions, etc., and, while wondering at their failure, entirely overlook such an important cause as ametropia.

Although the writer states that he does not wish to belittle the importance of careful refraction work, he makes a statement which, to my mind, is absolutely misleading—"there is an unmistakeable tendency to go too far and to overrate the importance of refraction work." Any experience in the clinic or private office of a careful refractionist gains gratitude, compensation, and reputation at the expense, and to the detriment of his unbelieving brethren. As to the student's preference for refraction, in view of the fact that 80 to 90 per cent. of the oculist's private practice consists in the correction of ametropia why should not refraction be the important part of his initial studies?

Finally, it is stated that "it is time to insist that we should always act as ophthalmologists and not merely as refractionists." When we consider the multitude of facts foreign to the refraction, that influence us in prescribing glasses, and the necessary general advice we give our ametropic patients, factors in which personal skill, with all the finer ophthalmic apparatus, personal knowledge of ophthalmology and, last but not least, personal judgment, founded on profitable experience enter, I fail to see how it is possible for a man to be a careful refractionist without being a thorough ophthalmologist.

In addition, is it not unwise to make such a distinction, to be eagerly seized upon and advertised by unscrupulous opticians? It is possible the writer of this misleading editorial intended to convey the idea that too many men, with only a slight knowledge of refraction and fitting glasses, are practicing as oculists, and naturally proclaiming with brazen trumpets, the importance of their limited knowledge. In this I heartily concur, but what the editorial actually says is so full of misstatements, wrong inferences, and reflections upon men who have conscientiously studied the art of refraction only as a part of the great whole of ophthalmology, that, if uncorrected, it cannot fail to partly counteract the beneficial influences of the recognition of the importance of refraction, which, by their courage of conviction and tenacity of purpose, American oculists have fairly forced upon the whole ophthalmic world.

WALTER L. PYLE,

119 South 17th St., Philadelphia, Pa.

TRANSLATION.

Cataract Discission.—*Anton, Elschnig, Vienna*, (Wien. klin. Wochensh. 53, IX.) contributes a lengthy and exhaustive monograph on discission. He gives a thorough historic retrospect and careful study of the present status of the operation. It was the earliest operation done for cataract; first by Henkel after Celsus (1776) who made a scleral puncture and ruptured the posterior capsule in order to get absorption of the lens. Later couching came into vogue, the lens being depressed into the vitreous or into the anterior chamber. In 1788 Beer did discission with his cataract knife. He thought that the operation, although often difficult to perform, was theoretically the best then devised and his opinion is still recognized. Early in this century, Saunders, an Englishman, made valuable contributions and advised discission for congenital cataract only. Scarpa recommended *discissio per corneam* as safer than *per scleram*. Rosas advised it as a last resort in high myopia. The term "discission" was first suggested by Beer and "dislaceration" by Jaeger and Jungken.

Arlt considered discission in two classes, (*a*) those in which the anterior capsule was ruptured to expose the lens to the aqueous; (*b*) those following cataract extractions. He preferred corneal puncture. According to v. Graefe the operations included in the first class must be very limited in number and the principles which he laid down are still valid. Glaucoma and iridocyclitis are dangerous sequelæ which can not always be avoided. v. Graefe proposed that iridectomy be done one week prior to the discission as a means of eliminating these dangers.

Whether the iris should be mutilated in order to obviate the dangers mentioned is a question for consideration in every case, particularly since it can not be thought to give absolute security. Eyes react very differently after discission and it is impossible to state the etiology of the phenomena which follow, but when done for lenticular opacity the condition of the lens substance is of importance and too little attention is usually paid to it. It may be that the debris acts as a chemical and mechanical irritant to the iris and ciliary body, or, as Prof. Schnabel suggests, the swelling of the lens may cause undue pressure or tension upon the iris and ciliary body and cause iridocyclitis. The lodging of particles of debris in the filtration angle is cited as a cause of increased tension of the eye-ball. In lacerating the cap-

sule too great tension may be made upon the zonula and violence be done it with serious results. The wound in the capsule may be too small or the lens be partially dislocated. There is greater liability to these errors when the old technic is followed. Thier has made radical changes in the operation and uses a small cataract knife.

In discussing v. Arlt's second class of operations E. states that the original needle operation had little to commend it as vision was rarely much improved by it and suppuration frequently followed. Many operators agree in attributing these bad results to faulty technic. The established procedure called for puncture per scleram which is quite indefensible on account of the fallacy of operating in the dark and the danger of intraocular hemorrhage. When improperly constructed instruments are used the cornea may be wounded and bruised excessively in operating per coream and fibres of vitreous may be drawn into the wound when infection may easily occur. Antiseptic precautions can not be relied upon since the field of operation can not be rendered perfectly sterile. That the needle leaves a torn ragged wound is often shown by the distinct scar formed in healing. No instrument is less suited to the purpose than the "discission needle". Good and even excellent results have been secured by scleral puncture with the knife. A modified Graefe knife, which fills every indication for discission has been in use by E. for some years and is entirely satisfactory.

Schnabel's technic requires that the puncture be made in the sclero-corneal junction which, he thinks, gives quicker healing and excludes the possibility of vitreous protrusion. The discission knife point is approximated to the eye-ball laterally in the horizontal meridian 1 mm. external to the limbus, the flat of the blade being parallel to the iris. It is passed into the anterior chamber until the point reaches the center of the pupil, then by reversing the motion the capsule is cut. The knife is carefully withdrawn and the anterior chamber remains normal. This procedure combines all the advantages of the needling operation with none of the disadvantages.

E. commends this as the best known method of doing discission for lenticular cataract, but prefers the following for very thick capsules following cataract extraction: The small discission knife is entered near the upper edge of the cornea perpendicular to its tangent, passed to the lower margin of the pupil and made to sever the capsule through its entire vertical extent. In this way the knife is used to the greatest advantage since it is perpendicular to the capsule. If the capsule does not cut readily a slight sawing motion may be made regardless of the

vitreous. A disadvantage of the operation is that the vitreous may follow the knife into the corneal wound, delay its union and increase the danger of infection. But E. in a great many cases has never seen it happen.

Discission was highly commended by v. Graefe as a maturation process principally in senile cataract. Its effect in this respect varies greatly. Sometimes it causes complete ripeness in a few days, again it may require a very long time. The results are so often unfavorable that it is to be considered entirely unsuitable for a ripening process. It has been shown by Schnabel's observations in a large number of cases that all uncomplicated cataracts in persons above 50 may be easily removed from the eye without any remainder being left in the eye. It is a matter of utter indifference whether the lens presents a distinctly opaque nucleus or not, or whether the cortex be streaked with opacities or be quite unchanged. Those cataracts which show an intensely white nucleus with transparent, bluish-white anterior cortex are least suited to operation but tend to mature very rapidly. All other cataracts may be safely operated upon as soon as the vision is so reduced that the patient can not perform his usual duties.

WÜRDEMANN.

REVIEWS.

Hysterical Monocular Amblyopia Coexisting with Normal Vision. — Dr. Morton Prince, of Boston (*American Journal of the Medical Sciences*, February 1897), reports two cases in which there was normal binocular vision, but monocular vision was defective. This defect he considers hysterical, and refers to observations of Parinaud, Pitres, Regnard, and Charcot, in support of his views. The nature of the defect he says is a psychical one, "the sensory images not entering into that chain of associated ideas which constitutes the individual's personality." "The hysteric really feels and hears and sees. The sensory impulses coming from the periphery are not only physiologically recorded, but are perceived by the subject and associated with other mental processes." The variations in vision are analogous to what occurs in the areas of common sensation. In hysterical amblyopia the tests applicable to organic amblyopia are liable to lead to grave error.

Case I. was a male who was thrown forward in an electric street

car which was suddenly stopped by a "trivial" collision and the action of the brakes. He was confined to bed fourteen months afterwards with pain, nausea, and paresis. Eighteen months after the injury he showed left hemiplegia (face not involved), left hand-grasp feeble with eyes open, almost *nil* with them closed; walks with help; tongue protrudes straight; left hemianesthesia and hemianalgesia, involving face; no atrophy; paralyzed limbs not spastic; knee-jerks equal and normal; hearing impaired, more on left side; pain in the back of the head and spine; spine tender; cries without cause; irritable and became violently excitable during examination; thought he was the object of a conspiracy. The vision of the right eye was good, but that of the left "was much impaired." The right eye being closed, he could not count fingers at one to three feet, though seen indistinctly; but at eight feet "he could count them, or rather he saw them multiplied." A candle at this same distance was seen, but as "splashes of light." Ordinary type could not be read at any distance. The eye was color-blind, and the visual field was "retracted."

The genuineness of the amblyopia was tested by slipping a pencil between the sound eye and the print while he was reading. If one eye be blind, the patient should be unable to read by this test, as the pencil would cover a part of the letters necessary to be seen with the sound eye. But to the author's surprise he read without interruption. This test would suggest malingering. It was therefore decided to make further tests. A strong convex lens was interposed between the sound eye and the printed page, and he stopped reading at once. Next a lighted candle was held about eight feet from the patient, and with the "amblyopic" eye it was seen "only as splashes of light." When, however, with both eyes open a prism was held before one, he saw two distinct flames, one similar to the other.

The author admits that this case was involved in litigation for damages, and that "the tests gave results similar to those obtained in simulated blindness;" but the other phenomena observed could hardly be reconciled with the theory of deception.

Case II. A man was very desirous of obtaining a position on the police-force of Boston. On examination he could not meet the requirements of the test for vision. On May 9th, 1896, he was examined, when it was found that vision of the right eye by Snellen's test-types was $\frac{1}{5}$ —, and that of the left was $\frac{1}{5}$. Binocular vision, however, was $\frac{3}{10}$, "which was better than normal." The patient

"said that he could not see well with each eye separately, but he could see perfectly, if he used both eyes together." Two or three years before, he had been rejected for defective vision in each eye, greatly to his surprise, as he always thought that he had good sight. He at that time consulted an oculist who confirmed the "fact that with binocular vision his sight was normal; it was only with monocular vision that his eyesight was impaired." The visual field was normal, but at this time there was partial color-blindness.

Examinations were subsequently made, one in conjunction with Dr. J. J. Putnam, and another by Dr. O. F. Wadsworth. At one of these the vision, both monocularly and binocularly, was the same as on the day before. On holding a prism before one eye "*amblyopia developed at once, and diplopia was not exhibited*," no matter in what direction the base of the prism was placed. After this test, the patient was made to hold a "diaphragm," "a piece of paper in which a hole was cut," or "an ophthalmoscope without a lens" before one eye, but to use both eyes for vision. At first the "amblyopia was not removed," but later he could see perfectly through it. Dr. Wadsworth's examination showed that the amblyopia persisted when two prisms, being placed together so as to counteract one another and make what was equivalent to a plain glass, were held before one eye. This experiment, according to Dr. Wadsworth, seemed to show that the failure to see was "due to some sort of mental inhibition by auto-suggestion."

On the next day, when the prism was held before either eye "the amblyopia was nearly removed," the patient being able to read type that he could not read if either eye was blindfolded, and there was no double vision, whatever the direction of the axis of the prism. In turning the prism around, the test object moved with it, as happens with a normal eye, the other eye being closed. The patient was given a book which, with binocular vision, he read "perfectly." When a strong convex glass was placed before one eye, he stopped reading at once and could not proceed. With the test with a screen binocular vision was not restored, but "the amblyopia continued in each eye." The pencil-test was a failure at first, but Dr. Wadsworth afterwards "succeeded in obtaining vision in one amblyopic eye under conditions similar to those under which the amblyopia developed." The patient at first was unable to read the letters obscured by the pencil, but "by a process of education" he succeeded in "overcoming this amblyopia and producing a monocular vision." This was done by holding the

pencil to one side, where it could still be seen, and then bringing it in front of the type. "The patient now read all the letters, although some were obscured to each eye."

At the second examination color-perception and the field of vision were normal. The tests wearied the eyes to an exceptional degree and produced a quivering of the eyelids "so frequently observed in hysteria."

"In all other respects the patient was a perfectly healthy individual."

The author feels that this case "settles the question once and for all of malingering as an explanation of the apparently paradoxical phenomena observed in hysterical amblyopia."

ALVIN A. HUBBELL.

ABSTRACTS.

ABSTRACTS OF ARTICLES PERTAINING TO THE OCULAR NERVOUS APPARATUS.

By H. GIFFORD, M.D.,

Omaha, Neb.

Hereditary Ophthalmoplegia Externa.

Panas (*Archives d'Ophtalmologie*, Dec., 1896) reports a case observed by Gourfein, in which the grandmother, son and four grandsons were all affected with double-sided, congenital ophthalmoplegia externa, which was complete, so far as voluntary movements were concerned, except in the case of one of the boys, who had some power of motion in the external and internal rectus of one eye. Slight nystagmus, mostly rotatory, was present in all the eyes examined, also a certain amount of amblyopia ($V = \frac{1}{3} - \frac{1}{6}$). The functions of the iris and ciliary muscles, so far as ascertained, were intact. Ophthalmoscopically, nothing decidedly abnormal was observed. With regard to the etiology, Gourfein concludes that the lesion is not nuclear, but consists in an hereditary muscular atrophy, differing from the type described by Leyden, Erb, Charcot and others, only by being localized in the extrinsic eye muscles. Noteworthy is the fact that while all of the grandsons were affected, the two granddaughters had perfectly normal eyes.

Paralysis of Divergence.

Although Parinaud reported cases, a number of years ago, which seemed to show that there was a special apparatus for divergence, which could be paralyzed without the conjugate motions of abduction being affected, the matter has received very little attention compared with that accorded to paralysis of the converging power. Straub reports three cases (*Centralblatt fuer Augenheilkunde*, Jan., 1897) bearing on the point, which had the following symptoms in common: The patients complained of diplopia, although the lateral and vertical motility of each eye seemed unimpaired. The diplopia was found to be homonymous, and most marked when the gaze was directed at some distant object, straight ahead. When the observed candle was brought nearer, the distance between the double-images became steadily less until at a distance of from 10—36 cm. they were fused. The images also came together gradually when the candle was moved to either side on a level with the eyes. When the candle was moved toward the patient until the diplopia disappeared and then taken farther away again, the images remained fused until a point was reached considerably farther from the eyes than that at which the diplopia had disappeared when the candle was being brought toward the eyes. Straub maintains that these could not have been cases of simple paresis of one or both external recti on account of the fusion of the images on looking to either side; and this symptom, which was not observed by Parinaud, he considers to be the distinctive feature of this affection.

One of the cases was seen only once. In another, the patient had other paralyses, caused probably by a brain-tumor. The third patient improved under the use of potassium iodide (which had no effect for two months, if at all), and after three and one-half months was almost as well as ever.

The Eye-Symptoms of Hereditary Ataxia.

On the text of a family in which four of the children were affected with Friedreich's disease, Burr (*Annals of Ophthalmology*, Jan., 1897) discusses the eye-symptoms generally present in such cases. Nystagmus, occurring on attempted fixation or voluntary motion of the eyes, is common, while static nystagmus, i.e., nystagmus of the resting eye, is very rare. The pupillary symptoms vary. Either contraction or dilatation may be present. The reactions are apt to be sluggish, but the typical Argyll-Robertson pupil is not common. "Marked optic atrophy never occurs"; though "a white discus in one case" and

partial atrophy in another have been reported. In the cerebellar type of hereditary ataxy, on the contrary, optic atrophy with contraction of the fields, or amblyopia, is common. The strabismus, diplopia, blepharospasm and ptosis which have been observed in Friedreich's disease are probably to be regarded as complications rather than as a part of the symptomatology of the affection.

Acute Rotary Nystagmus — Optic Neuritis Due to Dental Irritation — Sudden Partial Homonymous Hemianopsia with Transient Auditory Symptoms.

Marlow (*ibid.*), among other interesting cases, reports the foregoing. The first patient was a woman, aged 44, who, after having severe pain in the top of the head, noticed her vision getting dim, with diplopia and an apparent whirling of all objects looked at. Examination showed marked rotary nystagmus, blurred optic disk-margins, with surrounding retina somewhat hazy, and rounded whitish areas in the macular retina. Later, the movements of both eyes were freer to the right than to the left, and there was decided impairment of the downward movement of the left eye. During the next three months, the nystagmus disappeared except in extreme deviations of the eyes from the position of rest, and the V. improved from $\frac{3}{6}$ and $\frac{6}{60}$ to $\frac{6}{12}$, both s. des. Acute nystagmus is certainly very rare except in the case of miners, and in connection with serious nervous diseases, and it remains to be seen whether this patient's nervous symptoms will not develop into one of the well-marked types. The abstracter would suggest that the reports of all such cases should be deferred until as complete an account as possible of the natural course of the disease can be given.

In the case of the second patient, a woman of 25 years, toothache and swelling of the face was accompanied by marked optic neuritis of the same side, with slight exophthalmos and pain on moving and pressing the eyeball. All symptoms improved rapidly on the opening of an alveolar abscess of the first upper bicuspid. This seems to have been one of those cases in which the infection of the orbital tissue is conveyed through the neighboring veins without the intervention of an antrum abscess.

The third patient, a woman of 28 years, was attacked almost simultaneously with partial right-sided hemianopsia and a severe tinnitus with slight vertigo, with no defect of hearing. In the course of two months the tinnitus ceased entirely, but a loss of the entire right upper

quadrant of the field, and part of the lower quadrant remained. There was the usual exception from the hemianopsia of a small area at the center. Marlow suggests two possible explanations of this complex of eye and ear symptoms: First, that the lesion may have been situated in the hinder third of the posterior limb of the internal capsule, where the visual and auditory fibers are closest together; second, and more probably, that the main lesion, embolus or hemorrhage, was situated in the visual center in the occipital lobe, and was accompanied by a vaso-motor disturbance of the same hemisphere, to which was due the tinnitus with the vertigo.

On Secondary Atrophy in the Nuclei of the Motor Nerves of the Eye.

These changes have been mainly studied experimentally in the lower animals, but Sachs (*Archiv f. Ophthalmologie*, XLII., 3) has had three cases which further materially our knowledge of the conditions existing in the human brain. The first patient was a child of 26 months, whose left orbit was eviscerated for sarcoma of the globe and optic nerve; death from sarcoma of the brain occurred 69 days thereafter. The other two patients were old people with right-sided abducens-paralysis, persisting in one case nine months, in the other, three years, before death. The cause of the paralysis, in the first of these two, was pressure from an endothelioma of the dura; in the other, an interstitial neuritis of the basal part of the nerve. The microscopical examination showed in all these cases, degeneration of the abducens nucleus on the side of the affected eye, while the nucleus of the opposite side was normal. No evidence was found to confirm the opinion of Duval that the abducens-nucleus sends a small bundle of fibers to the inferior rectus of the opposite side. In the case of the first patient, degenerative changes were found in the trochlearis-nucleus on the side opposite to the eviscerated orbit, only; and Sachs agrees with Kausch in considering this nucleus to consist only of that group of cells which constitute an immediate distal (posterior) prolongation of the oculo-motor-nucleus lying in a depression of the posterior longitudinal fascicle and characterized by interruptions and asymmetrical development on the two sides. On the other hand, the group of cells described by Siemerling as the "main trochlearis-nucleus," lying dorsad and mesad of the beginning of the trochlearis nerve, Sachs considers to have no connection with the trochlearis system. The oculo-motor nucleus showed degeneration on both sides, crossed posteriorly, uncrossed anteriorly, while a central area on each

side showed crossed degeneration, dorsally, and uncrossed degeneration, ventrally. These results, indicating that the origin of the abducens is uncrossed, that of the trochlearis crossed, while that of the oculo-motor is partly crossed and partly uncrossed, agree in the main with those obtained by other students of this region of the human brain, and with the experimental results of Gudden in the case of rabbits. With regard to the superior lateral oculo-motor nucleus of Darschewitsch, Sachs could find in it no signs of degeneration on either side, and hence doubts its connection with the oculo-motor system. In the fact that what was left of the nerve trunks after the evisceration of the orbit were comparatively normal at their distal ends, but showed signs of degeneration, increasing in proportion to the proximity to the nerve-centers, Sachs sees a confirmation of the "cellulifugal" theory of nerve degeneration, according to which, if a nerve be injured, the ensuing atrophy does not simply spread in both directions from the seat of the lesion. It spreads distally unless (as in the case of the optic nerve) there are important trophic centers at its peripheral extremity; and in the proximal portion of the nerve the atrophy which occurs is secondary to changes in the nucleus itself, these changes being probably in the nature of an atrophy from disuse or inactivity.

[On the Anatomy of the Optic Chiasma.]

For a number of years, practically, the entire ophthalmological world with the exception of Michel of Würzburg, has accepted the partial crossing of the optic nerve-fibres as a fact, but at the last anatomists' congress in Berlin, interest in the question was again revived by Kölliker, who, after extended anatomical studies of the chiasma in man, dogs, cats, foxes and rabbits, decided in favor of a total crossing of the fibres, and his views seemed to meet with general acceptance by the anatomists present. This has led Grützner (*Deutsche med. Wochenschrift*, 1897, 1 and 2) to investigate the subject anew, from a purely anatomical standpoint. He points out that because in a microscopical section (and the conclusions of Kölliker seem to have been largely based on such sections) all the fibres are seen to be crossing from one side to the other, we have no right to conclude that in other planes of the chiasma some of the fibres may not have started from the same side to which, in the section, they seem to be crossing. In other words, fibres may start from one nerve to the opposite side of the chiasma and then, in another plane, pass out into the tractus of the side from which they started, thus giving in a microscopical section, at

the latter plane, a misleading impression of a complete crossing. The impossibility of following the complicated course of the fibres through a series of sections leads Grützner to return to the older method of attempting to unravel the knot of fibres by teasing them out under a low magnifying power. To facilitate this, he adopted Stilling's plan of soaking the chiasma for some days in a mixture of glacial acid, creasote and water. This method gives results fully as valuable as the study of microscopical sections, if not more so, and with much less outlay of time. The anterior and posterior commissures can be seen at once, also the S-shaped course of the crossed fibers, and, finally, one can quite easily separate fibres which, apparently, run from one tractus to the nerve of the same side, although in so doing they do not follow the shortest course possible. Nor is there a well defined, solid, uncrossed bundle, as the current diagrams would lead one to expect.

In further support of the semi-decussation, Grützner, after mentioning the cases from the older literature in which each optic nerve ran directly from one side of the brain to the eye of the same side, cites, with numerous other facts, the more recent case of Ganser in which a bundle of fibres sprang from the posterior part of the right tractus and passing forward, entirely separated from it, entered the optic nerve of the same side 34 mm. behind the globe; also the case of Siemerling, in which one tractus was found to be entirely destroyed, although the patient had had during life useful vision with the eye of the opposite side.

On the Situation and Dimensions of the Optic Chiasma and its Importance in the Diagnosis of Hypophysis-Tumors.

Anatomists generally describe the chiasma as lying in the depression of the upper surface of the sphenoid known as the optic groove, thus placing it entirely anterior to the hypophysis; and some authorities, accepting this as true, have explained the bi-temporal hemianopsia which often accompanies tumors and hypertrophy of the hypophysis as the result of pressure by the latter on the posterior part of the chiasma and the optic tracts. According to Zander (*Vereins-Beilage der Deutsche med. Wochenschrift*, 1897, 3, p. 13), who has examined this region in 100 skulls, this groove is present in only 34 %, while in 44 % there is not only no groove, but a bulging upwards of this bony surface. Moreover, when the groove is there, the chiasma does not lie in it, but considerably farther back, so that in many cases the hypophysis lies entirely in front of the chiasma, between the optic nerves,

and never behind it, though the length of the intra-cranial portion of the opticus varies so much (from 6 to 21 mm.) that the chiasma sometimes lies directly over the hypophysis. This indicates that when, from enlargement of this body, well-marked bi-temporal hemianopsia occurs, the tumor must lie well forward, pressing only on the mesial surfaces of the optic nerves, since, in the chiasma, the fibres are so thoroughly mixed up that pressure even upon its anterior surface would probably cause trouble in both halves of one or both fields. Zander finds, in 60 % his cases, a decided dislocation of the chiasma toward one side or the other with a corresponding difference (sometimes 5 mm.) in the length of the intra-cranial portion of the optic nerve. This may account for some of the cases in which enlargement of the hypophysis affects only one nerve. Z. gives as the dimensions of the chiasma: saggital diameter 4—13, average 8.04 mm.; transverse, 9.75—19.75, average 13.29 mm.; vertical average, anteriorly, 3.10 mm., posteriorly, 1.25 mm.

[The text books on anatomy are often curiously inconsistent with regard to the relations between the chiasma and the hypophysis. They describe the chiasma as lying in the optic groove or on the olivary eminence of the sphenoid, which would, of course, bring it in front of the hypophysis; but in figuring the base of the brain the hypophysis is placed either just below the chiasma, or more commonly entirely in front of it, between the optic nerves, as Zanders says it is. An examination of Plates 6, 15 and 22, of MacEwen's Atlas of Head Sections, shows clearly that in some cases, at least, a considerable portion of the hypophysis must lie in front of the chiasma. They also make it plain that in case of the hypophysis lying partly below the chiasma and partly in front of it, there is a much greater space between the posterior part and the chiasma than between the anterior part and the optic nerves, so that in a uniform hypertrophy of the hypophysis the nerves would be pressed upon before the chiasma.—G.]

Amblyopia and Amaurosis of the Peri-papillary Zone of the Retina.

Berger (*Archives d'Ophthalmologie*, Nov., 1896) recalls the fact that the fibres in the distal portion of the optic nerve may conveniently be divided into three groups: 1. A central group, surrounding the central vessels and supplying the anterior part of the retina. 2. An intermediate group, supplying the equatorial region. 3. A peripheric or sub-pial group, immediately within the pial sheath, destined for the posterior part or, as B. calls it, the peri-papillary zone of the retina.

(The pupillo-macular fibres contained in a sector of the temporal half of the nerve constitute, of course, a partial exception to this plan.) From this arrangement, it follows that any process invading the nerve at its periphery will show itself in an enlargement, absolute or relative, of the blind spot, and, if the process proceeds at all gradually, the absolutely blind area will be surrounded, more or less completely, by a zone of amblyopia. A process developing around the central vessels of the nerves, on the contrary, will show itself first in a peripheric contraction of the field, and a similar contraction will result from any decided diminution of the calibre of the central vessels, through interference with the nutrition of the region supplied by the terminal arterials. Berger reports several cases of netro-bulbar lesions of the optic nerve in which the blind spot was decidedly enlarged. In one of them, a case of aympathetic optic neuritis, this symptom was of especial interest as tending to confirm the view of Deutschmann, that the inflammation spreads from one eye to the other, through the inter-vaginal spaces, penetrating from the latter into the periphery of the nerve-trunk. He has also observed it in locomotor ataxia, alcoholic amblyopia, atrophy from artero-sclerosis, and hysteria. In testing for this symptom, it should be remembered that the center of the blind spot, normally, is about 12° from the point of fixation and that its diameter has been found to vary from 3° to 9° , the average being 6° — 7° .

EYES STRAIGHTENED.

The popular opinion that persons who are born cross-eyed or who may become so at any age, cannot have their eyes straightened, is at last exploded. An eminent eye specialist of Detroit, Dr. John Blank, has discovered a form of treatment which is entirely free from pain whereby any case of crooked eyes may be straightened and that without taking the eyes out. We have occasionally heard of people being obliged to have their eyes taken out in order to have them straightened, but this the doctor says is absolutely unnecessary by his form of treatment, he having successfully straightened a large number of cases during the past year.—*Windsor Review*.

REPORTS OF SOCIETIES.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held April 13th, 1897, Dr. Montgomery in the chair.

Dr. K. K. Wheelock, of Fort Wayne, was elected a member. The Secretary read the applications of Drs. A. E. Bulson, Jr., of Fort Wayne, and E. A. Lawbaugh, of Chicago.

Dr. Ware showed a colored boy, nine years of age, on whom one year ago there appeared a swelling at the outer-upper angle of each orbit. These swellings increased rapidly in size, so that they became about three-quarters of an inch long, projecting forwards and downwards, dislocating both lachrymal glands and causing complete ptosis of both lids. The patient was first seen about a month ago and a diagnosis of specific periostitis made. Under large doses of iodide the swellings rapidly decreased, so that at present they can hardly be felt. There was no pain at any time in the course of the disease.

Dr. Colburn opened the discussion on Muscular Asthenopia by reporting four additional cases of chorea treated by tenotomies.

The first case is a girl of 10, with a hyperphoria of four degrees and exophoria of thirty degrees, which was corrected by operation. Four weeks after the operation the patient was well and has been so since.

The second case, a girl of 26, chorea of three months. Operated on twice and cured.

The third case, a boy of 5½, improved by the correction of 2½ D. of astigmatism, but chorea remained on using the eyes. No operation was done in this case.

Fourth case, a boy of 10, with marked degree of astigmatism, the correction of which cured the chorea.

Dr. Colburn reported four additional cases of epilepsy, all of which were cured. He thinks that of the different heterophorias, hyperphoria is far more important in the causation of muscular asthenopia than insufficiencies of the lateral muscles. His statistics showed a large percentage of asthenopic cases due to anomalies of the extrinsic muscles, and his results have been very satisfactory.

Dr. Haight reported two cases of heterophoria, one with 4° , and the other 12° exophoria, both of which were cured by operation.

Dr. Coleman had in years past operated a number of times for muscular asthenopia; but had found the results of operation so very uncertain that he had practically given it up, confining himself only to those cases that have diplopia. He found many cases in his own experience and in that of others where, after the muscular error was completely corrected, the heterophoria had returned in from one to three months, and no amount of operation was able to permanently correct it. He had also found that the methods of testing for heterophoria were very unsatisfactory and uncertain.

Dr. Hotz reviewed 61 cases in his own practice, 10 with hyperphoria, 21 with esophoria, and 30 with exophoria, in which operations had been done with satisfactory results. He found that hyperphoria was most often the cause of symptoms. He had found that exercising the muscles after the manner of Gould was of no value in these cases.

Dr. Gradle thought that less than 1 per cent. of all cases of asthenopia had any relation to muscular troubles. He had found many people without any symptoms with marked degrees of muscular trouble. The only cases that he had thought important were those where there was what was formerly called a latent squint, but these cases do not have true asthenopia; they have diplopia. Dr. Gradle considers that muscular asthenopia is merely an expression of one of many symptoms in a neurotic person, and he does not believe that balancing the muscles by operation is the best method of treating such cases.

Dr. Colburn, in closing the discussion, referred to the fact that it was not sufficient to test a patient's muscles with the eyes directed straight ahead. It was of great importance in many cases to test the muscles with the eyes in a different position.

C. P. PINCKARD,
Secretary.

SECTION ON OPHTHALMOLOGY.

College of Physicians of Philadelphia.

Meeting of the Ophthalmic Section of the College of Physicians of Philadelphia, March 16, 1897. The President, Dr. Wm. F. Norris, in the chair.

Dr. Wm. T. Shoemaker reported, for Dr. Chas. A. Oliver, a *Case*

of Traumatic Sub-Conjunctival Dislocation of the Lens. A 34-year-old woman fell and struck her right eye against the thumb latch of a door. Two days later the lens mass was seen resting upon the sclera in the upper inner ciliary region. The cornea was hazy, anterior chamber partly filled with blood, the iris retracted and tremulous and presented a large coloboma. No fundus reflex could be obtained. The lens was removed by conjunctival incision. No sutures were used and no reaction followed. At present the scleral scar is firm and discolored and the coloboma unchanged. The remnants of the torn capsule are faintly visible in the pupil. Vision with a correcting glass is $\frac{3}{80}$.

Discussion.—Dr. W. F. Norris stated that it was his experience that staphyloma frequently followed injuries of this character when the edges of the ruptured sclera were not united by sutures. The fact that the pupil is crossed by a few opaque fibers of capsule shows that the capsule was ruptured at the time of the accident.

Dr. G. C. Harlan referred to a case of dislocation of the lens under the conjunctiva, in which he had seen the patient occasionally for several years. There was useful vision and the eye was not interfered with as it remained quiet. In another case he had removed the lens by incision. It was found that the rupture of the sclera had been closed chiefly by the adherent lens capsule, and a cystoid cicatrix resulted, followed later by a considerable staphyloma. In all the cases he had seen the lens had been forced out through the upper corneoscleral junction. This is usual in this accident, which is generally the result of a blow from a blunt instrument, such as the fist or a billet of wood, striking the ball below and forcing against the roof of the orbit. The sclera is ruptured by contrecoup and the lens is extruded.

Dr. M. W. Zimmerman reported a *Case of Bilateral Pigmented Tumors, Probably Cysts of the Ciliary Bodies.* Mrs. J., aged 59, with good family history, had been under observation since April, 1893, when she was seen by Drs. Harlan and Jackson in consultation. In the lower and outer quadrants of both eyes the iris was crowded forward by dark brown tumors presenting into the pupil between the lens and iris. The tumors, examined under mydriasis, were smooth and not nodulated and apparently not attached to the iris. Since the irides were not involved and the tumors could not be removed by iridectomy, no operation was advised and no treatment other than weak eserine was used. During the past four years the tumors had changed somewhat in outline, and that in the right eye very slightly increased in size. In

other respects the eyes were normal. There was no iridodialysis or other injury to the iris tissue. Vision equaled one-third of the normal.

Discussion.—Dr. Harlan had agreed that the iris did not participate in the disease. The case was decidedly obscure, but he believed that it would prove to be ciliary sarcoma. The absence of an important symptom of neoplasms in the region, namely inflammatory reaction, was noted. Usually the growth is adherent to the adjacent iris, and as it progresses into the pupil it carries the margin of the iris with it, producing iridodialysis. He thought, however, that this might occur later. But as it had not done so in four years, and as there had been but little change in the condition of the eyes, he thought now that the presence of a malignant tumor was hardly possible.

Dr. G. E. De Schweinitz read a communication on *Angioid Streaks in the Retina*. After briefly reviewing the literature and referring to his previous case, reported to the Section on Ophthalmology and to the American Ophthalmological Society, Dr. De Schweinitz presented a second bilateral example of extensive, branching, pigmented striæ in the retina, the anastomosing bands being easily traceable to their points of origin in hemorrhages. The patient, a brother of his previous case, was a working man, 50 years of age, who had been a hard drinker but who had suffered from no notable illness. Examination of the heart, kidneys, and blood yielded negative results. The pathology is obscure, and we are at present unable to say more than that these cases represent an unusual metamorphosis of retinal hemorrhage.

Dr. Edward Jackson suggested a *Modification of the Sight-hole of the Ophthalmoscopic Mirror*, to avoid all annoying reflexes from it. This consisted in making the sight-hole merely through the silvering, leaving the glass intact, and then cementing a thin piece of glass back of the sight-hole, extending beyond it on the silvering to protect it from dust. The dust falling upon either surface being easily removed, complete and permanent freedom from the luminous cloud caused by reflexes from the sight-hole can be obtained. The plan had been first applied to the mirror for skiascopy, and later adapted to that of the ophthalmoscope.

Dr. Wm. M. Sweet presented, by invitation, a novel apparatus for *Determining the Location of Foreign Bodies in the Eye by the Roentgen Rays*. By means of three horizontal rods of aluminum, each with a rounded extremity to be adjusted to the inner and outer

canthus and to the center of the upper lid, held in position on the patient's face by a band similar to that of the head-mirror, shadows are cast on the sensitive film. He prefers the double film to the glass photographic plate on account of its flexibility and lightness, and because mistakes in diagnosis incident to imperfections in one film or plate are avoided. The Crookes' tube, held 13 inches upward and backward opposite the parietal bone, emits rays that pass through the external orbital wall, the tissues surrounding the ball, and the ball itself, and are received on the film, which has been thrust as far as possible into the inner canthus, and maintained in position by a holder.

Two exposures are made, one with the tube on a line with the eye, and the other at an angle of 25 degrees with the horizontal plane.

The approximate position of the foreign body is determined by attaching the apparatus to an upright support and so placing a lighted candle that the shadow cast by the indicators will fall similarly to those thrown by the Crookes' tube. A small object is then held before the candle in such a position that its shadow is identical to that of the foreign body. A record having been made of this line of shadow, the candle is moved until the shadows of the indicators correspond to those on the second negative. The object is again employed and a second impression recorded. Where the two lines of shadow of the test object cross should be the situation of the foreign body in the eye. Knowing the distance of the center of the cornea from a fixed point of the apparatus, the distance that the foreign body in the eye lies behind this point, and therefrom its approximate position may be measured.

Dr. G. E. De Schweinitz presented a *Case of Suspected Sarcoma of the Ciliary Body* in a girl aged $6\frac{1}{2}$ years, with the symptoms of cyclitis, associated with mark iris bombe, the upper and outer portion of the bulging iris being of a grayish-black color, while the lower portion was of a greenish-blue. These symptoms had existed, according to the history for about three months, with occasional exacerbations of the cyclitis and periods of increased tension. The pupil was occluded and there was a small central corneal scar, but history of injury could not be obtained. Skiagraphic examination was negative. The bulging of the iris had notably increased during the last few weeks, and symptoms of sympathetic irritation were evident in the sound eye.

Dr. C. A. Oliver showed a *Case of Supposed Foreign Body in the Eyeball*. The left eye had been injured by a piece of flying metal from a steel drill some two weeks previously. The line of injury extended

through the cornea at its lower inner quadrant, the inferior nasal portion of the iris, and the lens, with a localized detachment of the retina and choroid at corresponding points. The pupil was heart-shaped. The media, with the exception of the isolated lens opacity, were clear. No foreign substance could be seen.

Through the courtesy of Dr. C. L. Leonard, of the Pepper Laboratory of Clinical Medicine, the case is now being studied with the X-ray apparatus. A number of exposures are being made from different positions so as to obtain, if the body be present, a series of triangulations from which the actual situation of the foreign material can be determined.

Dr. C. A. Oliver showed a case, with water-color sketches by Miss Washington, illustrating both the early and the late appearances of *Thrombosis of the Inferior Temporal Vein* of the left eye, the conditions being found, at an interval of two years, in a young man without any history of traumatism or relevant dyscrasia.

HOWARD F. HANSELL
Clerk of Section.

WESTERN OPHTHALMOLOGICAL, OTOLOGICAL, LARYNGOLOGICAL AND RHINOLOGICAL ASSOCIATION.

[CONTINUED FROM THE APRIL NUMBER.]

Dr. Flavel B. Tiffany, of Kansas City, Mo., read a paper on **"Skin Grafting for Malignancy of the Orbit and Entropion."** (Abstracted in the April issue of the RECORD.)

Dr. Reynolds: I did not quite understand where the graft is made in a case of entropion where there is loss of substance from the border of the lid? Do you make it from a distance?

Dr. Tiffany: I usually take a piece from the lid, a completely detached graft without any pedicle, removing the strip of integument two or three millimeters from the margin of the lid, then split the lid-margin and transplant this. Sometimes I go deeper than the integument into the tarsus, and take out a wedge-shaped piece, so as to pull up the margin of the lid and turn the layers into their normal position.

Dr. Reynolds: Skin grafting was revived in this country after the publication of an extract from a prize essay by a Frenchman named, I think, Reverdin, and subsequently in 1870 the late Dr. John T. Hodgen wrote on the same subject. In the meantime I had made

a couple of experiments or experimental attempts to use it, and in one of my cases, a case of entropion of the upper lid with profuse loss of substance near the central portion, and cicatrical contraction, sharp and complete in the central, and only partial along the margin, I dissected up and transplanted a portion of skin taken from the forearm of the patient, and everything seemingly did very well for the first two or three days; it underwent the peculiar change described by Reverdin and I thought the patient was doing very well, but one night I was summoned and found him in a state of syncope from loss of blood. I did what was then a new operation, divided the external commissure of the eyelids and then split the fresh border, and without removing any portion of the skin I slipped it up higher and the patient made a very satisfactory recovery. I have had other cases in which that proceeding was not sufficient, where the tarsus had been absorbed. In that case I have divided the free border of the lid, notched it upwards at the outer and inner canthi (performing in some cases external canthoplasty) and then dissected up a bridge of the sound skin a distance of two or three millimeters above the line of the lashes and about two millimeters broad, passing that down and stitching it at two points only near the outer and inner canthi and allowing the center portion to lie loosely. I have never seen sloughing take place after such an operation, and I have nearly always had the happiness to observe an entire recovery from the entropion. As to cutting out a wedge-shaped piece of cartilage or detaching the cartilage or cutting the elliptical fold of integument down to the surface of the tarsus, I believe I have gone the rounds; I have tried all of them, and the operation advocated some years ago by Dr. Hotz, of Chicago, seemed satisfactory in some cases, but in nearly all of them the entropion returned. So the transplanting of a bridge of skin from above is the quickest and most satisfactory, combined with external canthoplasty. I am sure that no operation will apply to all cases, but I am equally sure that Dr. Tiffany's experience is valuable and the method he uses does apply to some cases and give a more reasonable prospect of relief permanently than perhaps any other operation.

Dr. Wheeler; I would like to ask for some information about a case I will report. About a week ago last fall I enucleated an eye for an epithelioma occurring at the outer canthus, involving the eyeball and recti muscles and periosteum. I took away the entire upper and lower lids, going well down under the cheek and up into the brow and well back into the temple. I eviscerated the orbit, took out its entire

contents and packed it with a fifty per cent. solution of zinc-chloride. Afterwards the patient went away from my town, and I recommended her to a physician in Illinois whose name I have forgotten. But in about a year this patient returned and came to my office to see me, and I found that it was covered entirely with a dermoid covering; there was no trace of an operation or of a scar—no scar tissue was left or at least visible to the naked eye. I am at a loss to know just what occurred there.

Dr. Reynolds: What was the lapse of time?

Dr. Wheeler: About one year. Dr. Bulson saw the same case.

Dr. Alt: You did not attempt any covering of the bone of the orbit?

Dr. Wheeler: None whatever.

Dr. Alt: Was the periosteum removed?

Dr. Wheeler: It was only scraped.

Dr. Reynolds: My impression is you have had the same experience as myself. I removed an immense sarcoma from the orbit in a gentleman 24 years of age. He was very much emaciated at the time of the operation, but gained flesh rapidly and improved in every way, and in a few months time the orbit was covered over with the same sort of growth described by Dr. Wheeler. He went on five long years without any signs of trouble, when the parotid gland became enlarged and in a few months a melano-sarcoma appeared at the brow. I applied a solution of half a drachm of chloride of zinc in an ounce of water. My patient finally died, but the cicatrical contraction closed the orbit.

Dr. Tiffany: I would like to say in reply to Dr. Reynolds, I still maintain that those grafts which were used at that time were merely shavings placed on the ulcer to cure it, as it were, but we now use them to cure and destroy the epithelial cancer cells. That never has been mentioned in any article that has ever been written prior to the one that I wrote, and for several years since there has been no opposition to that fact to my knowledge, and I have looked up the subject very carefully. So I claim in this case that it had a specific effect in destroying the malignant cells. The healthy cells killed the malignant cells; it is like the grafts on a sour apple tree, as it were, bringing forth good fruit. In these cases when you apply these healthy grafts there is no return of the disease. That has been my experience, not in one case, but probably in from fifteen to twenty cases. In regard to making canthotomy, I sometimes make that, but it always leaves a deformity, and I avoid it unless it is absolutely necessary.

Dr. W. H. Baker, of Lynchburg, Va., read a paper on "Mental Depression apparently the result of a Double Graduated Tenotomy." (Abstracted in the April issue of the RECORD.)

Dr. Reynolds: This paper leads me to remark that in heterophoria attention is often directed to local manifestations that are frequently only signs of a constitutional dyscrasia.

Dr. Fryer: This matter of heterophoria should be considered, as Dr. Bulson said, in reference to the correction of the hypermetropia. It is a fact that a man constantly using his eyes for near work should have in reserve at least two-thirds of his muscular power, and in giving correction by prisms or operations we must remember it. This matter of so-called partial tenotomy I insist is a failure. There is no such thing as a partial tenotomy. The tendons of the body are composed of a most unyielding tissue; unless the tendons of the eye muscles are divided entirely there is no effect. It is absolutely impossible to get a change of tension unless the whole tendon is divided, I care not what Dr. Stevens or any other man says to the contrary. There are cases I have seen in New York under Dr. Stevens' care, where twelve, fourteen or twenty so-called partial tenotomies have been done. In the west here most of us are satisfied with one or two at the outside. There are very few patients in the west who will allow more than one or two. To produce any effect from a graduated tenotomy you must separate the tendon from the ball.

Dr. Colburn: If the question of graduated tenotomy were under discussion I should take issue with the gentleman. I have had occasion to do it a few times, and have had a very decided effect, but it must be intelligently done.

Dr. Alt: Do you mean a permanent effect?

Dr. Colburn: A permanent one. It cannot, however, be done without experience. I can look over my earlier work and see where I made many errors in my attempts to do what was called and supposed to be graduated tenotomy. In fact, in every strabismus case it is of great benefit. I have never performed what is known as a full, complete tenotomy. I can get results in partial tenotomy that will give me all I have demanded for several years in my strabismus operations, by paying attention to the individual, to the tendon, to the check ligament or the capsule. I know it can be done. I have demonstrated it time and again; the effect of graduated tenotomy is a fact; it is not a fallacy and its utility is very great. Just as with the employment of weak cylinders or in the correction

of errors of refraction generally, the work must be done with care and intelligence, and it must be done in certain cases only after other means of correcting the muscular errors have been tried. But it has an effect, and it seems to me we are belittling our profession when we claim it has not and that we are throwing discredit upon the action of men who have done good service in this field of work. The case which gave rise to the paper is certainly very interesting, but it belongs to that numerous group of historical cases; the tenotomy may not have had a shadow of influence on it at the time, although it may have influenced it to some degree afterwards; the tenotomy may have been done by a man who was not competent to do it—we cannot tell that—but the fact that the patient was not better afterwards does not show that the heterophoria was not corrected to a certain degree. Then there are some cases of divergent strabismus I have seen where a complete tenotomy had been made and the eyes put in apparently good condition, and yet within a few months they returned to the old malposition. The rotation being again limited, a complete tenotomy being made with advancement, and yet in a few months the eye was back again. I recall the case of a young woman, a neurasthenic, who was using her eyes constantly for book-keeping and had nervous headaches of the megrain type. We went over her refraction and could not demonstrate more than half a degree of heterophoria, and I despaired of being able to relieve her, but I put on rest prisms and she complained no more, and it occurred to me that perhaps her position at her work had something to do with the trouble, and sure enough I put on the rest prisms and she went to work, and she is wearing them to-day with comfort.

Dr. Fryer: What I wish to insist on in regard to the so-called graduated tenotomy is this: there is the eye and here is the tendon fastened to it; according to Dr. Stevens' idea he divides the larger segment of tendon tissue, leaving two portions attached to the eye-ball fibers that are just as unyielding as the part that is separated. I say that from such an operation you may get a minimum result, but you cannot get any sufficient effect.

Dr. Colburn: Dr. Stevens does not operate that way.

Dr. Frye: Please describe the operation. That is the way he described it in his book.

Dr. Colburn: I have watched his work and followed his methods for years. He uses the annular ligament that forms the connecting

band between the superior and inferior recti as the anchoring bands. He leaves these lateral rings and cuts across.

Dr. Fryer: Then he has changed his method as originally described.

Dr. Colburn: I do not think he has been very clear. Many operators have been very deficient in their work, and I have seen some bad work and have done some myself sometimes, but I know how to do a graduated tenotomy.

Dr. Fryer: The way you described the operation now is not as Dr. Stevens originally did it.

Dr. Hickley: Some two years ago I spent two months in Dr. Stevens' office, and he described just how he did the graduated tenotomy, but standing over him I failed to see it done as he described it; it looked to me as if he cut the tendon off. In fact in some cases he would do a graduated tenotomy, so called, and on the next occasion, it seemed to me, he would cut the tendon off.

Dr. J. W. Bullard, of Pawnee City, Neb., read a paper on "Keratoconus." This paper was abstracted in the April issue of the RECORD.

Dr. Tiffany: In regard to the etiology of Keratoconus, I believe it is pretty well known that it is due almost always to interstitial keratitis, followed, first by a tissue degeneration, and then the intra-ocular pressure produces the conical condition. It is not a case of true myopia; it is irregular astigmatism. Sometimes it can be benefited by cylindrical glasses or by spherical concave glasses, but it cannot be very much helped as a rule. The operation suggested is the best, producing a flat surface, then making an iridectomy on one side.

Dr. Bulson: I am somewhat surprised to learn that conical cornea is caused by interstitial keratitis. My experience has been exceedingly limited with this class of cases; I have seen only two, one about six years ago, and the other last autumn, but I must confess that I never discovered anything that appeared to me like the existence of interstitial keratitis as I recognize it. It would seem strange to me that it should occur in such a small area, and that area in the center of the cornea. These cases appear on careful examination very like a bubble. Examining the conical cornea closely it looks like a bubble located on the anterior portion, and I cannot understand why it should not be more diffuse. The first case I observed I did absolutely nothing for. I found no means of giving any particular improvement, although

I tried some six or eight times and spent some considerable time over it. The other case was that of a healthy girl eighteen or nineteen years of age. She said she had noticed her vision failing about a year previously. Upon examination I found a typical conical cornea, a bubble-like appearance on the upper portion. There was no evidence of interstitial keratitis. No lens gave any improvement. The patients generally see fairly well for ordinary purposes—in fact the two patients could apparently read with comfort and without trouble, the main difficulty being to see at a distance, vision being reduced in one instance to 5-200ths.

Dr. Tiffany: In regard to the explanation I gave I will say that it is from my own experience. I have had hundreds of cases of interstitial keratitis, and they almost invariably terminate in conicity of the cornea. They do not have keratitis when they have conical cornea; that comes on afterwards, but it comes as a result of the interstitial keratitis.

Dr. Alt: I must confess that I also was astonished at the statement that keratoconus is the result of interstitial keratitis. There is no doubt of the possibility of the cornea becoming stretched in consequence of parenchymatous keratitis, but it so happens that but few cases that I recall had the slightest symptom or history of anything of that kind. I remember one young man with amblyopia for whom I did prescribe glasses and who developed astigmatism. With the keratoscope I was struck by a picture which reminded me forcibly of keratoconus. I told the young man I was afraid his cornea would develop keratoconus and asked him to let me see him from time to time. Within two years he developed a typical keratoconus in one eye, but I never had a keratoconatous keratitis. The other case I recall was in an elderly lady who puzzled a number of oculists in this: that she has an enormous keratoconus in each eye which is absolutely transparent. I have proposed an operation to her, but she will not consent. Of course we may have some cases in which we can get a moderate amount of sight, but a very great result I think nobody has reached. With regard to the etiology I have had occasion to examine two or three cases histologically, but I found nothing to explain the condition. In one eye there was scar tissue and a rupture of Bowman's membrane at the apex of the cone.

Dr. Bullard: So far as the cases I have seen are concerned there was absolutely no interstitial keratitis when I first saw them, but as the case progressed one could see with a lens an interstitial keratitis.

Dr. Geo. E. Bellows, of Kansas City, read a paper reporting "**A Case of Oculo=Motor Paralysis.**" (This paper will be published in the June number of the RECORD.)

Dr. Colburn: I have seen a case similar in some respects. About a year ago Prof. L. referred a gentleman to me, fearing that he had tubercular disease of the brain, as there had been a slight increase of temperature and a previous history of a cure of tuberculosis of the lungs. The man had apparently resumed perfect robust health. Then this rise of temperature, coming on with some little mental disturbance in the way of excessive nervousness, made Dr. L. very anxious, fearing he had tubercular disease of the brain. About this time the patient began to have paralysis of the muscles of the right eye. I cannot give the order in which it came. The recti muscles were paralyzed in the right eye, following that came ptosis. The left eye then became involved by a systematic rotation of paralyses, beginning with the third and going through, one after the other, nearly all the muscles involved in the paralysis. My impression was that we had a septic condition to deal with, if not diphtheria, or staphylococcus infection. I began to study the patient with reference to this. In examining the crypt of the tonsil I brought out membranes or substances that Dr. Federer examined under the microscope and pronounced staphylococcus accumulations. We then removed a portion of the tonsil, examined it, and found large cavities in which infection was taking place. After the removal of the tonsil the temperature became normal, the patient gradually became better, and the paralysis of the various muscles improved very rapidly. He had been under all sorts of anti-phlogistic treatment without a good result. Everything that could have been anticipated was done in the case, but until the tonsil was thoroughly cleared out there was no improvement. The paralysis began to get better, and the patient became practically well so far as the muscular paralysis was concerned.

Dr. Stillson: There is one point Dr. Bellows did not mention, and that is that the recovery of these cases of ocular paralyses are spontaneous in some cases, as in locomotor ataxia; there may at first be paralysis of the third nerve, followed by paralysis of accommodation and ptosis, the locomotor ataxia symptoms appearing later. The eye symptoms appear early; diplopia appears, but soon passes away, followed by paralysis of the muscles of accommodation, which after a time getting better become worse again. Reflex throat troubles will be present, such as spasmodic closure of the glottis; this will get better

and possibly pass away entirely. So we are sometimes liable to deceive ourselves when we attribute a cure of the ocular paralysis to a removal of the adenoid or tonsil, and I think it is wise for us to bear these things in mind, particularly when we have a paralysis occurring in locomotor ataxia and particularly in locomotor ataxia due to rheumatism or gout.

Dr. Barck: The most interesting points in the paper are those two just mentioned. But I cannot concur with the conclusions drawn by the author. I cannot agree that we can arrive absolutely at the conclusion that the seat of the trouble must be located in front of the chiasm. I believe that we all will be willing to admit that we cannot tell just how the fibers are running which cause the trouble. You are all aware of the fact, I suppose, that the idea which so long obtained of a semi-decussation of the fibers of the optic nerve in the chiasm is not questioned considerably. Within the last few years it has been maintained by several observers at least, that instead of a semi-decussation there is a total decussation taking place in the chiasm. So I think we had better content ourselves with stating what we do and do not know, and at present we do not know anything positive about the course of the fibers of the optic nerve at any distance or even immediately behind the eyeball itself.

Dr. Fryer: The important point seems to me in calling attention to the location of the lesion. I believe the majority of oculists will agree, notwithstanding the latter claims of these gentlemen whom Dr. Barck alludes to, that experimentations heretofore have proved a decussation. Dr. Bellows speaks of the rarity of these lesions of the nucleus. This is true, but occasionally we find a lesion on autopsy located to a single nucleus. *In the Brain*, published in London, which is the organ of the London Neurological Society, is a case reported where the lesion was confined to the left nucleus with a very peculiar combination, and the gentlemen (there were two of them) who reported the case made a very careful examination, and came to the conclusion from the symptoms, and they could exclude everything almost but this one nucleus, that the sixth nucleus was a co-ordinating one as well as presiding over the sixth nerve.

Dr. Bellows: I have just one remark to make in closing, chiefly in regard to the semi or total decussation. Dr. Barck says the general view heretofore held has been of semi-decussation, and further than that, in the arrangement of the fibers in the optic tract the decussation is such that you cannot affect one optic tract alone, you cannot affect

the fibers going to one eye. In regard to the decussation, whether semi or total, there is one case reported by S. Weir Mitchell of bi-nasal hemianopsia. On autopsy it was found that an aneurism divided the chiasm from before backwards. But if the case is correctly reported there must have been a semi-decussation, otherwise the total division must have produced total blindness; and assuming the case to have been correctly reported and assuming it to be a typical case, certainly total decussation must be excluded.

Dr. Dudley S. Reynolds read a paper on "**Astigmatism.**"

Dr. Jennings: In regard to the use of a cycloplegic in estimating astigmatism, I would like to draw attention to the different cycloplegics. I have tried all of them, and lately have been using scopolamin very largely, but I have finally drifted back to homatropin, because I could not discover that there was any error of refraction which would be masked and be brought out by scopolamin and not by homatropin. Scopolamin has the same disadvantage as atropin: the patient is not able to do his accustomed work for two or three days, and sometimes four or five, and when the cycloplegic has about half lost its effect the patient naturally tries to use his eyes, producing more or less eye strain. I prefer homatropin. I would strongly urge the proper application of homatropin. The lower lid should not be drawn down and a drop of homatropin put in, but the patient should be told to look down and a drop then put on the cornea, and as the eye rolls up the homatropin is evenly distributed over the whole surface of the cornea.

Dr. Corr: I have found mixed astigmatism to be present in about two per cent of all cases. I have always acted on the principle that static refraction cannot be responsible for astigmatism in but one meridian. If there is an astigmatism of another meridian it must be due to dynamic refraction. Now if we can wholly set aside the dynamic refraction by means of cycloplegics, we ought to do away with such astigmatism, and if so we ought to be able to resolve everything into a simple astigmatism. I have acted on that principle and have resolved quite a number of them into simple astigmatism, but I have not succeeded in reducing all. I think if I had continued the experiments I would be able to still further reduce them. If I am in error you have the privilege of correcting me. You cannot have an astigmatism in a static refraction except in one meridian.

Dr. Driver: I would like to inquire what part of the hypermetropia is corrected in Dr. Reynold's cases of compound hyper-

metropic astigmatism, and if he makes a complete correction or only partial.

Dr. Alt : I cannot quite agree with Dr. Reynolds as to the effect of the homatropin. I have not been able to get the effect, even where I used a double dose. I used Merck's, still I could not get a complete cycloplegic effect, and I used the instillations every five minutes for an hour, and in several instances I have had poor success in getting a complete effect, particularly with young people. I can scarcely agree with Dr. Jennings in his statement about scopolamin. By the careful use of the drug I have had with the ordinary dose the same effects as I would with atropin, and I certainly differ in regard to the effect of homatropin. It would be a very good thing if we could always rely upon it, but I am certain that in young people we cannot.

Dr. Driver ; I wish to say that I agree with Dr. Reynolds. In young people I have found nothing so satisfactory as sulphate of atropin. I have tried the other drugs, and although I have not had a very large number of cases, I can say that we do not get the paralysis that we have a right to expect, and therefore I have discarded them and now rely wholly upon atropin, notwithstanding its disagreeable effects for four or five days. I consider it the most efficacious and most reliable.

Dr. Reynolds : In regard to homatropin, of course I do not know how the gentlemen use it, nor what particular dose is applied, nor how you determine the presence of complete cycloplegia. I found that it would not do to use sulphate of atropin with my patients and keep them away from business three or four days, which it would often do, using a one per cent. solution and applying it three times a day. Frequently it produced toxic symptoms which made it necessary to discontinue its use. When homatropin was introduced I hailed it with delight and seized upon it at once, and the experimentations which I carried on at a large clinic at the hospital, as well as in my private practice. The records kept have enabled me to satisfy myself of the usefulness of the drug. I was able to secure complete suspension of accommodation, using a solution of four grains to the ounce, two instillations a day. But the solution must be made fresh every day. I will not use to-day a solution which was made yesterday. I find it deteriorates rapidly, not in its capacity to dilate the pupil, but to produce suspension of accommodation. I determine the presence of cycloplegia by the use of the stenopaic disc, first rotating it before the eye and thus find the plus meridian, and then if the lens is required to

bring it out I bring it down to the sharpest degree of acuity of perception and make a memorandum of that on a piece of paper, putting down the meridian plus four diopters. Then I find the lens which will at right angles to the first one correct the degree of refraction, and if they differ I subtract one from the other and take the smallest amount of error of refraction as representing the spherical lens and the largest the cylindrical. Then I have the patient look through that, and if the result is obtained, then of course the cycloplegia is complete. If I do not get the same result I am suspicious and send the patient back for further drops to be instilled. I do not wait forty or fifty minutes after the instillation, but only thirty minutes. Sometimes I have the patient go back a third time, but they usually succumb to one or two instillations of homatropin, and inasmuch as it produces no unpleasant symptoms I value it very highly. But the solution should be fresh, and when properly used it satisfies all requirements. I have no respect for solutions that are found on the market.

Now as to the value of Javal's ophthalmometer, Dr. Edward Jackson, of Philadelphia, maintains that sixteen per cent. of cases of total astigmatism are revealed by the ophthalmometer in its most improved form. It is a time-saving machine—it measures with approximate accuracy the different curvatures of the cornea, but the different curvatures of the cornea have very little relation to the total astigmatism of the eye, and since it is for the purpose of correcting the total refraction we must not busy ourselves with those nice little attempts at measuring curves of the surface of one of the reflecting areas, but take the whole thing. Less than a week ago two students of the college came to me complaining of violent headache; one of them said that he felt as if there was something attached to the eye-balls drawing them back in his head, and it became impossible for him to read, and if he went on the street and saw a person with a striped dress he became nauseated; he had never known a time when stripes looked perfectly perpendicular to him. I have hypermetropic astigmatism myself of one-twelfth, and yet for a long time under the action of the sulphate of atropin I was under the impression that I had only one-twentieth. Now one-twelfth is about three and one-half diopters and one-twentieth is about two diopters. With the atropin I did not have a complete suspension of accommodation, but the glasses were such a vast improvement upon nothing that I toiled on, and I have not required a spherical lens at all. I really supposed that it required $\frac{1}{2}$ to correct my astigmatism until I made the test with homatropin.

It is not necessary to correct this wholly, nor is it necessary to wear glasses constantly. This student whom I spoke of, who could not read or study, could do without glasses for a great many things, and it may be of interest to the microscopists, that no matter what the error of refraction may be when using the microscope glasses need not be worn. The skiascopy test is exceedingly nice; it is scientific, and approximately accurate results are obtained by those who have time to work with it. Before the use of homatropin I was under the impression I had only one-twentieth, and under a complete suspension of accommodation it turned out that my astigmatism is plus one-twelfth, and I use a minus glass when I go on the street. I am past fifty-four years of age; still I cannot go out on the street and see distant objects with a plus one-twelfth glass, but I wear just half that amount; I have minus one-twenty-fourth. I know it is opposed to the teaching and dictum of our masters in the profession.

Dr. Tiffany: Do I understand you to use a minus glass for distant objects?

Dr. Reynolds: I am looking at you through a minus one-twenty-fourth.

Dr. Tiffany: Without a plus glass?

Dr. Reynolds: No plus glass at all.

Dr. Tiffany: It seems to me that it is probably more of a mixed astigmatism; that is, that he now has presbyopia and so does not need a concave glass for near objects.

Dr. Reynolds: I have no presbyopia. I would like to have you examine me.

Dr. Tiffany: I would like to ask Dr. Reynolds if he treats his patients in the same manner? When he finds a plus astigmatism, if he gives a minus glass?

Dr. Reynolds: If it is of high grade I do.

Dr. Driver: I would like to ask Dr. Reynolds this question: Say we have a case of compound hypermetropic astigmatism, does he correct the hypermetropia with the astigmatism? Say you have plus two diopters with plus one diopter cylindrical, do you correct it for your distant reading?

Dr. Reynolds: They do not generally require glasses for distance. People of course vary in that respect; some of them will require correction for the street. I recall now a case of a man who wears a plus lens, and he has ordinarily no use for the cylindrical lens, but when he

goes to read he requires a full compound lens, so that people vary in that respect.

Dr. Elliott Colburn read a paper on "**Congenital Nystagmus.**"

Dr. Tiffany: I agree with Dr. Colburn, that many of these cases are due to insufficiency of the extrinsic muscles of the eye, and that the treatment should be directed towards the correction of the existing error. I think, however, that this may be accomplished by gymnastic exercise without surgical interference. I have found that in rotary nystagmus the trouble usually lies in the oblique muscles, in the horizontal nystagmus the lateral muscles are affected, and the vertical variety is due to some insufficiency of the superior or inferior recti.

Dr. W. E. Driver, of Norfolk, Va., read a paper on "**A General Consideration of the Etiology and Treatment of Choroiditis Suppurative.**"

Dr. Corr: The puzzle which presented itself to Dr. Driver is one which also presented itself to me. When I first began the study of ophthalmology I was struck with the fact that the books and teachers said that almost all forms of choroiditis were of syphilitic origin. In several papers which I have read before different associations I have maintained that the trouble may arise irrespective of the existence of syphilis, and these cases will get well without anti-syphilitic treatment. I do not know what its origin is, probably rheumatic in many cases.

Dr. Tiffany: I agree with what Dr. Corr has said, that choroiditis is not always due to syphilis. Consanguinity may, in many cases, account for it. Why this should be I do not know; the offspring of cousins, in my observation; almost always have choroiditis.

Dr. Suker: As regards every case of choroiditis being syphilitic I oppose it. I have had occasion to see in a large clinic many cases of choroiditis of syphilitic origin, but I have also seen many cases where there was no trace of syphilis.

Dr. Driver; I have not much to say in closing. My idea in bringing this subject up is because I think a large number of patients are treated on the theory that they have some remote form of syphilis, and we are too much in the habit of putting our patients on anti-syphilitic treatment; it does not matter who the patient is, if he has a choroiditis we adopt as a routine treatment anti-syphilitic treatment; in other words we prescribe mercury and iodide of potash. I think a differential diagnosis should be made in these cases, as it is such a grave thing, such a serious thing, to pronounce a case syphilitic. I think we ought to be more particular before doing so; we should

diagnosicate our case before we prescribe. That was my object in presenting the paper. We are usually taught that choroiditis is due to syphilis. I was for a time resident physician in an eye and ear hospital in Baltimore, in connection with which there was a large clinic. I noticed that while in the syphilitic cases we could find syphilitic iritis and other manifestations of syphilis, it was seldom we saw a choroidal lesion.

Dr. George Knapp, of Vincennes, Ind., read a paper on "**Ophthalmia Nodoso.**"

Dr. Colburn: During the last year a member of the Chicago Ophthalmological Society reported a case similar to Dr. Knapp's. Last year a case occurred in the clinic of one of my neighbors, in which we were able to demonstrate the hair on the conjunctiva before it had penetrated very deeply; it was removed. A hair was also found penetrating through the cornea partially into the anterior chamber, causing a most serious and provoking irritation. Its removal was effected by passing the keratome through the cornea, bringing it up under the hair, holding it firmly against the cornea, while a slight incision was made beside it.

Dr. W. L. Dayton, of Lincoln, Neb., read a paper on "**Hysteria in Ophthalmology.**"

Dr. Corr: Some time ago I saw a lady who for three weeks had been unable to have her eyes unbandaged and said she could not see. On going into her house I found every avenue of light closed up, her eyes bandaged and a bandana handkerchief lying over her face. Inquiring into the circumstances, they told me I could not examine here, as no light could be let in. After talking to her gently about her disease I gradually removed the handkerchief, and in a short time she allowed me to take the bandage from her eyes. A little cocain was dropped into her eyes, and after gaining her confidence she opened her eyes widely. I told a friend of the patient, the manager of a religious sect, that the eye trouble was purely mental. She immediately called the members of the sect together and began to pray for the recovery of the patient. The result was most satisfactory as regards the cure.

Dr. Colburn: About a year ago a gentleman was referred to me with corticollis of the most distressing kind; he was a robust, fine looking man physically, a perfect athlete. Having lived for years on the plains, he was accustomed to all sorts of outdoor exercises, brocho riding and bucking and everything which a man of courage would attempt. About a year before he came to me he had suffered for a

time with persistent pain in the back of the head and neck, accompanied by frontal headache. These symptoms were shortly followed by contractions of the left trapezius muscle, which finally became permanent. The surgeons whom he consulted, thinking the difficulty was in the muscles of the right mastoid, made a section of them, without relief of the symptoms. Soon after this he was confined to the house with photophobia, which I thought to be hysterical in character. Having gained the confidence of the patient, I began the treatment of his case by correcting the astigmatism which I found present. Very shortly the corticollis, which he had had for three years, gradually yielded and he was able to walk with his head straight. With the exception of a slight spasm of the trapezius on becoming excited, he never relapses into his old condition.

Following papers were also read :

“Hemorrhagic Glaucoma,” by Dr. Adolph Alt.

“Report of a Case of Double Mastoid Disease,” by Dr. J. O. Stillson, of Indianapolis, Ind.

“Adenoid Vegetations,” by Dr. Ellet Orrin Sisson.

“A Case of Carcinoma of the Lachrymal Glands,” by Dr. J. Ellis Jennings.

“An Improved Skiascope,” by Dr. J. Ellis Jennings.

“Advanced Method in Teaching the Deaf,” by Dr. Goldstein.

“Hypertrophic Rhinitis,” by Dr. W. T. Grove, of Eureka, Kansas.

“Reports on Cases of Ophthalmia Neonatorum,” by Dr. F. T. Reyling.

“Experiments on the Eustachian Tubes by Means of the Tongue Thrust into the Naso-pharynx,” by Dr. Stillson, of Seattle, Wash.

“Retarded Closure of the Wound after Cataract Extraction,” by Dr. Charles Barck, of St. Louis.

“The Function of the Stapedius and Tensor Tympani Muscles,” by Dr. Thomas F. Rumbold.

“The Value of Weak Lenses in Correcting Errors of Refraction,” by Albert E. Bulson, Jr., M. D., of Fort Wayne, Ind.

“The Technique of Cataract Extraction,” by B. E. Fryer, M. D., of Kansas City, Mo.

THE OPHTHALMIC RECORD

A Monthly Review of the Progress of Ophthalmology.

VOL. VI.

CHICAGO, MAY, 1897.

NO. 5. NEW SERIES.

EDITORIALS.

CONCERNING THE SECTIONS OF THE AMERICAN MEDICAL ASSOCIATION AND OTHER SOCIETY MEETINGS.

While the value of local scientific societies, medical and otherwise, is unquestioned it would seem that the recent crop of special societies is but a fungous outgrowth that can only tend to detract from the value of or diminish the attendance on well established national gatherings.

Progressive physicians, particularly the specialists, make it their practice to attend large conventions, such as the American Medical Association and its Section meetings, and the several societies which form the Congress of Physicians and Surgeons, in which they may be interested. In the Section on Ophthalmology of the American Medical Association and in the American Ophthalmological Society the greater lights in American Ophthalmology are usually found. Men meet on the level and make valued friendships and acquaintances besides receiving a mental pabulum of the highest class. The papers generally are of ability for the reason, at least in the several meetings at which the writer has assisted, that many papers have been written by special request and the others have been sifted through the sieve of selection.

Well meaning but abortive attempts have been made to organize sub-divisions of these general societies or rival associations on the specious plea that our country is so large that a Southern Section or a Midland, Western or Valley Society is needed. Railroad facilities are now so good that a few hours travel suffices to bring our Western,

Southern or Eastern brethren together. The busy ophthalmologist usually attends his state, county and city medical societies also and generally has many other demands upon his time. As a rule, he does not attend these meetings for vacation purposes but for work in the line of his professional duties; he cannot afford to throw away his time, his brains and his labor of preparation or attendance upon poorly attended societies.

A meeting may have been particularly well advertised, the published program may contain the names of prominent men from the North, East, South and West and from Foreign Countries and yet eventuate in an attendance of a half dozen or less. The score or so of men working in the same specialty in the convention city may not attend and the corporal's guard that comes to order at the sound of the president's gavel must indeed be considered but a sorry reward for the labors of the organizers. Papers are read by title and the meeting adjourns with practically no discussion. "And the mountain labored and brought forth a mouse."

H. V. W.

MEDICAL SOCIETY PROGRAMS.

The practice of sending in titles to Medical meetings without expectation of attendance simply for the advertisement connected with the association of the author's name on the program and the eventual publication of the article with this connection is radically wrong, even though the paper may be written and forwarded to be "read by title." The free discussion elicited by the presentation of one new idea gives life to a meeting and is particularly desirable at national gatherings. The criticisms brought forth are often of more value than the paper itself.

Theses read by title may be eventually printed but even if of value the life has gone out of them as the writer can not have profited by critical discussion which may lead him to change or modify his views.

Programs should be sifted of such dead wood by the officers of the societies. Men who have practiced such a policy should consider that their efforts are largely wasted and reserve their papers for meetings which they may be able to attend in person.

H. V. W.

THE USE OF THE TERM HETEROPHORIA.

There seems to be a prevalent misconception of the term heterophoria, the word being often used as synonymous with insufficiency. The word heterophoria is derived from the Greek and means a leaning

to one side. The terms esophoria, exophoria and hyperphoria simply designate the direction of the leaning.

Dr. Stevens has been a strong opponent of those who advocate insufficiency of the muscles as the cause for turning of the visual axes away from their normal positions in binocular single vision. When he proposed the terms esophoria, exophoria and hyperphoria, he supplied terms that designate the direction of the ocular rotation, not on account of muscular weakness, but because the globe was not properly placed in position at the time of its formation. When all the muscles acting upon the globe are at rest, the globe tends to swing into the position which nature ordained for it, but owing to the law of binocular single vision, it is turned from the direction of its natural tendency until the visual axes converge at a given point. Stevens has never advocated that the muscles doing this turning are weak, or insufficient. Before Stevens proposed his heterophoric terms we were in the habit of speaking of insufficiency of the externi, interni, etc. His terms being shorter and more convenient, we began altering our nomenclature by saying in a given case, insufficiency of the interni, eyes turn out, hence this is a case of exophoria. Some of us never adopted Stevens' theory, but did adopt his nomenclature. So today we find some of our writers speaking of exophoria, and, in the same sentence, in order to avoid repeating the term, designating the trouble insufficiency of the interni. We think, in justice to Dr. Stevens, that his terms defining the different kinds of heterophoria should not be used unless his theory is also accepted, and the presumption that heterophoria is due to insufficiency, dropped.

G. M. B.

THE INCREASE OF ERRORS OF REFRACTION.

Within the past thirty years, the remarkable increase of refractive disorders, has forced the attention of the Profession to consider and investigate the conditions which may be responsible for this increase.

That a much larger proportion of our youth are afflicted now than in former times, must reasonably be admitted. That we have newer, more accurate methods of determining these conditions and therefore find them, when in former years they escaped our examination, will hardly satisfy the careful student. Modern libraries, so constantly filled with eager readers, the ease with which books and especially modern novels, may be secured by all, and our present Public School system, are probably the chief factors to be considered. Undoubtedly the most prolific of these causes, will be found in the methods of

instruction followed in our schools, commencing with the Kindergarten and ending with the University. The constant and prolonged fixation and convergence of the eyes on finely printed books, must be the chief element in the development of astigmatism and the increase of myopia. The Public Schools have been so filled with material in recent years, that many of the younger oculists, under the guise of charity, have used them for their own professional and financial advancement, while the ambitious optician, not to be outdone, seeks authority for the admission of his blank prescription form to every school. Under these circumstances the examination is a farce, often an abuse.

In some instances, the already over-worked teachers, have been required to exercise the simplest tests, but errors were so frequent, that this added burden was removed. And yet, the necessity for the early detection of these errors and their correction is a real one, and the best means to secure this result should be determined. A child is not at present admitted to school without a certificate of vaccination. In the interest of the child, should not a certificate of good or corrected vision be required as well? Every year applicants are rejected by the United States Military and Naval Schools for refractive errors, in anticipation of their increase, and while this is a reproach to us, it proves the necessity for early and increased care.

It is to be hoped that this important subject will no longer be neglected, and that some proper remedy will be found. The most complete and thorough means, we would suggest, would be the employment of a competent oculist, by the State, with income sufficient to dispense with practice, whose only duty would be to protect our children's eyes.

W. E. H.

We are indebted to Dr. G. L. King of Alliance, Ohio, for the following extract from the law passed in Ohio relating to the prescribing of glasses by opticians.

RESOLVED: That the act of prescribing or adjusting glasses in uncomplicated cases of visual defects shall not be held as practicing medicine within the meaning of the law, but that the act of prescribing glasses or adjusting the same without the order of a physician in any case in which the vision cannot be brought up to the normal and in which, in addition to visual defects, there exists any inflammatory condition, organic change or disease of either the constituent or auxiliary substances of the eye, *shall* be held as practicing medicine within the meaning of this Law.

THE OPHTHALMIC RECORD

VOL. VI.

CHICAGO, JUNE, 1897.

NO. 6, NEW SERIES.

ORIGINAL ARTICLES.

A CASE OF BINOCULAR DIPLOPIA WITH MONOCULAR DIPLOPIA IN EACH EYE.

By **CHARLES E. WOODRUFF, M. D.,**

U. S. Army, Fort Sheridan, Ill.

ILLUSTRATED.

The following case presented such a bewildering contradiction of symptoms and was such a puzzling matter to the patient for nearly half a century, that it is reported as a curiosity of ophthalmic practice.

The patient, Mrs. B., 56 years old, a highly cultured woman of much more than average intelligence, has gone through life with a complex collection of ocular anomalies sufficient to discourage an average person.

Her family is a remarkably myopic one, her paternal grandfather, her father, paternal uncle, her brother and one cousin being more or less myopic. In her cousin's case the disease progressed so far as to disable him completely. In his later years he required the constant presence of an attendant and secretary.

In very early childhood she had either measles or scarlet fever, she does not know which, but believes that her eyes were badly inflamed at the time. At four years of age, during a railroad journey, she got a cinder in each eye, and the resulting inflammation was so severe that she was taken to a New York specialist who excised something from each eyeball, but she has no recollection of the exact location of the parts removed. For several years after this she had numerous attacks of inflammation in which the eyes were very painful and she was frequently confined to a dark room, at one time for two weeks. She has had no return of these attacks for about forty years.

At eighteen years of age she accidentally discovered that she was myopic. In a playful mood rather than with any serious intention she put on a pair of glasses belonging to a myopic friend and had the usual experience of such cases. She found that what she had considered a normal view of the outer world was a very confused blurred one. It is quite probable that the myopia was not then of as great a degree as at present. Twenty years ago, when thirty-six years old, she consulted a prominent ophthalmologist who gave her concave spheres for distance and told her there was some astigmatism and that the two eyes were not alike. She wore these glasses with comfort until seven years ago, and since that time has not had glasses which were satisfactory. She had glasses prescribed about seven years

ago, but they were soon worthless. She has never worn a correction for near work, having been able to read comfortably all her life, though she has considerable difficulty in sewing, as will be subsequently explained.

About eight years ago she discovered for the first time that she saw double. Seeing two persons side by side who were walking across an open lot she noticed that they were exactly alike and, covering one eye, was aware for the first time of this new complication. This had probably been going on for an indefinite time, since having investigated the matter she found that what she had for a long while believed to be two distinct lights, when she saw them at night, were in reality but one. It will subsequently be seen why such an intelligent person should have double vision for a long time and not know it. About this time she noticed that the crescent moon appeared to have six fairly well defined points.

She occasionally had pains above and back of the eyes and on top of the head after reading, but no pains *in* the eyes. Looking at scenery soon gave a tired nervous feeling. In other respects she has been healthy all her life and is the mother of seven healthy children. Sometimes she thought that she saw best in a bright light, sometimes in a subdued light, but she could never face the light and read comfortably. Some times reading was difficult for a short time.

Present Condition.—The preliminary examination showed that there was a well marked monocular diplopia in each eye, perhaps polyopia in the left: O. D. V. = $\frac{15}{60}$, but the letters were shadowy and each had the beginning of another near it. Reads small type clearly at from 18 to 29 cm. With $-5.50 \text{ C} -0.50 \text{ ax. } 145^\circ$ V = $\frac{15}{60}$ and no astigmatic subjective symptoms. O. S. V. = $\frac{15}{60}$, but the letters appeared to be broken in pieces or parts of two or more letters where one should be seen. She read indistinctly at 11 cm. Her distant vision was improved with any glass between -1.00 and $+3.50$. $+2$ gave $\frac{15}{60}$.

Skiascopy with undilated pupils gave very discordant results, the shadow going sometimes one way and sometimes in another in a most unaccountable manner, and it had to be abandoned until the pupil was dilated.

The examination of each cornea by oblique light showed with great distinctness a superficial opacity. In the right eye it was oval, about 2 by 3 millimeters, and situated in the right lower quadrant nearly reaching the center. In the left eye it was nearly circular, about 2 millimeters in diameter and almost exactly central. Two millimeters to the left of this opacity there was another very small and circular one. These opacities had probably existed for fifty years, and yet until this examination the patient had never known of their existence.

The ophthalmometer showed in the right cornea an astigmatism of 1 D, the greater curvature at 55° , less at 145° . By examining the reflected image with Placido's disc the central part of the cornea was found to have less radius of curvature than the annular zone measured by the ophthalmometer.

In the left eye the ophthalmometer showed an astigmatism of 1.50 D, the greater curvature at 45° and the less at 135° , but Placido's disc showed the central part of markedly less curvature than the annular surrounding zone.

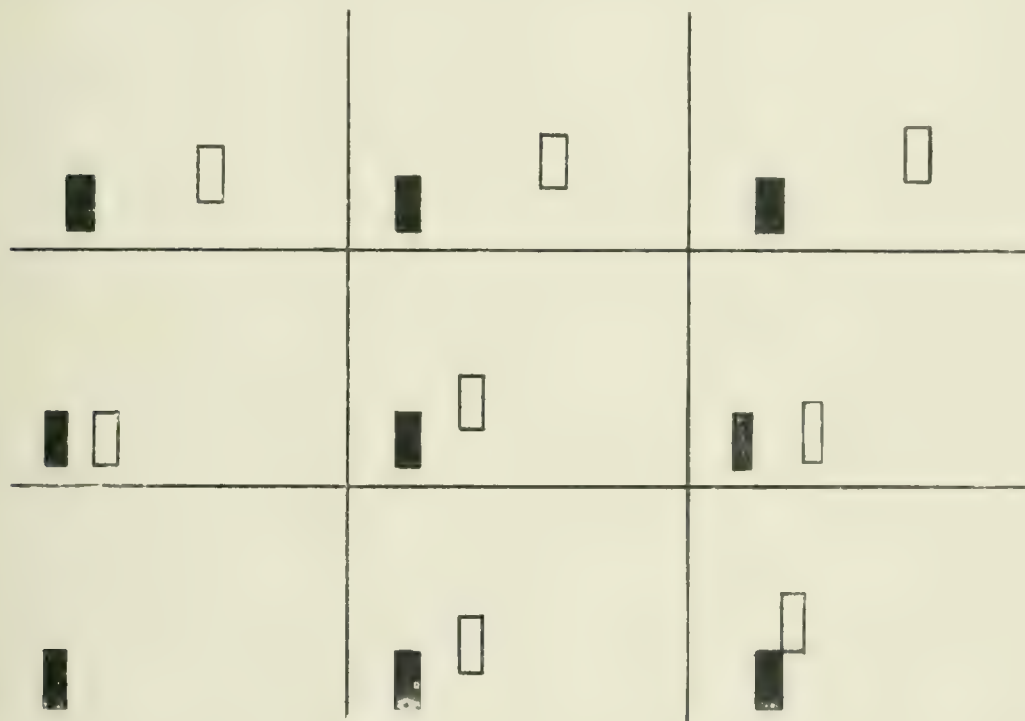
With a moderately dilated pupil skiascopy showed each eye myopic and astigmatic. In the right the refraction was corrected with -6 at 55° and -5.50 at 145° . In the left eye it was -5 at 45° , and -4 at 135° . With the following glasses: O. D. $-5.50 \text{ C} -0.50 \text{ ax. } 145^\circ$ V. = $\frac{15}{60}$. O. S. $-3.50 \text{ C} -2 \text{ ax. } 135^\circ$

V. = $\frac{1}{30}$. The vision was very clear, sharp and distinct, pupils moderately dilated. With these glasses the monocular diplopia disappeared in each eye.

Ophthalmoscopic examination was difficult, owing to the opacities and their accompanying irregularities of surface, but it was possible to make out the details fairly well with a -6 lens. The atrophic crescent in each eye was quite large, in its widest part having a width of something more than the diameter of the disc. It has a very irregular outline and in one eye completely surrounded the disc.

The field of vision was slightly contracted above.

The binocular diplopia was tested with a candle at 15 feet. It was found to be a crossed diplopia, increased on looking upward and to the right, and the images figured below correspond closely with the typical diplopia of paresis of the left superior rectus, though both images were always vertical.



Images of candle at 15 feet. The heavy image is the true and the light one the false, the former perceived by the right and the latter by the left eye.

The diplopia for near vision could only be brought out occasionally and then only when the eyes were turned upwards to the extreme limit. The image of the right eye was directly under that of the left, and the vertical distances between the two increased as the eyes were moved laterally. There is also a slight occasional lateral displacement of the images on lateral movement of the eyes. These tests caused a feeling of intense nervousness and could be carried on but for a very few seconds.

The whole course of this case probably depends on the fact that the patient has never known what clear vision is, and has made no effort to secure what she did not know was possible. Otherwise it is reasonable to suppose that a much higher degree of posterior staphy-

loma would have resulted from the constant strain. From the family history it seems likely that the myopia, nevertheless, has not wholly resulted from the habit of bringing her work near to her eyes to secure a larger retinal image to compensate for the indistinctness due to the opacities.

The visual line of the right eye diverges very considerably from the optical axis, the angle being about 15 to 20 degrees, as near as could be estimated. By this means the patient utilized the nasal side of the cornea as far removed from the opacity as possible. Through constant use, then, of the part of the retina to the temporal side of the macula a most curious result has been produced. It being practically impossible to get a clearly recognized image on this part of the retina, she has never succeeded in obtaining a clear view of a letter or of a word, but has always been satisfied with the general shape of the word, just as the normal eye, in reading, always appreciates the next word following the one looked at on the line for an appreciable time before the visual axis is directed to it. This constant education of the temporal side of the retina has resulted in a markedly increased power of recognizing more words in a printed line on each side of the spot upon which the eye is fixed than is normally found. Whereas the normal eye can barely recognize short words on each side of one, say of six or eight letters, this patient has a recognition of several words with enough distinctness for practical purposes, though none of them is seen distinctly. As a result she reads with remarkable rapidity. The one single test I made was a paragraph unfamiliar to her but very familiar to myself. She read it in 12 seconds, while I took 22 seconds. To one watching her it sometimes seems as though she took in a whole line at a glance. Though there are rapid movements of the eye across each line, the excursions of the eye are not as extensive as in the normal. This is a remarkable compensation for faulty vision. When clear vision is necessary failure is very frequent. In trying to thread a needle the effort is severe, painful and often fails. She sometimes abandoned the attempt from a feeling of nervous strain.

The visual axis of the left eye seemed to bring the image nearly but not quite upon the macula. From the central portion of the opacity to the left cornea there is greatly reduced vision in a bright light when the pupil contracts to the area of the opacity. This nyctalopia, or day blindness, in this eye has resulted in partial suppression of its image for distant vision and accounts for the fact of the resulting muscular paresis. In the right eye the very opposite condition of partial night blindness, or hemeralopia, results, for in a bright light the contracted pupil excludes the light from all the cornea except the clear, well curved center, and the vision is improved, but at night the dilated pupil, admitting light from the irregularly curved area of the opacity, increases the diffusion circles and impairs the vision. Under the circumstances it is easy to understand why a diplopia for distance in the day time should have been unrecognized so long.

At night in a poor light the state of affairs is reversed, and the

vision of the left eye being so much better, the diplopia is very evident. This accounts for the vision of the crescent moon with five or six points, and the fact that in the day time diplopia may not be evident from suppression of the blurred image of the left eye. The vision of the right is not much reduced by dilatation of its pupil. From such a complex condition it is quite evident why the patient should be so much bewildered by her symptoms, and it is a matter of pure experiment for her to obtain the proper illumination. Experience shows that it is a mild subdued light, just sufficient to enable a normal eye to read with comfort. By this means the left pupil is dilated just enough to use the corneal zone around the central opacity, and the right is not dilated sufficiently to cause interference from its opacity. If the walls of the room are bright and the light shines in the eyes, the pupils are too small. She always has a feeling that if she could only change her position as regards the light she could get clear vision while reading. This feeling is to be expected, as she has actually been unconsciously experimenting in this direction so many years.

The flattening of the left cornea at its center compensates in some degree for the elongation of the ball, and there is produced the remarkable combination that while the pupil is dilated the vision is very myopic; the more the pupil is contracted the less the myopia becomes. Part of this is no doubt due also to lessening of the diffusion circles and part to the habit of interpreting indistinct, blurred images. Hence is probably explained the ability to see through convex glasses with a contracted pupil ($V. = \frac{15}{16}$), but concave with dilated pupil. These subjective tests correspond with the results of skiascopy before a mydriatic was used, the direction of the motion of the shadow depending probably upon the size of the pupil.

In the day time the left eye is probably not used, and this explains why the left superior rectus should become the paretic muscle, upward motion of that eye being no longer required. In reading, on the other hand, the left eye is used, as the light is usually not bright enough for contraction of the pupil, hence we would not expect binocular diplopia for near work.

As the left eye is practically useless in a brilliant light and as there are many occasions in which distinct vision is desirable for her when the light is of medium intensity, she was given the above glasses, which corrected the refraction when the pupils were moderately dilated. On repeated trials it was found that in a fairly good light from over one shoulder she could read quite comfortably at eleven

inches with the following : R. E.—1. L. E.—1.00 ax. $150^{\circ} \subset \cdot 1.00$ ax. 60° .

As long as she accepted these, with a proper arrangement of the light, and had managed so long without glasses it seemed as though an iridectomy is not advisable at present. Possible changes in the curvature of the cornea and the nutrition of parts of an eye at this age following an iridectomy would seem to indicate the postponement of such an operation until useful vision ceased to be secured from the above means.

THE CURVATURE OF THE CORNEA IN REFERENCE TO
THE REFRACTIVE CONDITION OF THE DIOPTRIC
APPARATUS IN THE TWO PRINCIPAL
MERIDIANS. *

BY FRANCIS VALK, M. D.,

Professor of Diseases of the Eye at the New York Post-Graduate School and Hospital, &c., &c.

In the examination of the anterior surface of the human cornea, we find the radius of curvature, different in the two principal meridians in a very large number of cases; in a smaller number or about one-fifth, the radius of curvature is the same in all meridians. In other words, in these last mentioned cases we have a perfect surface of revolution that we do not find in the large majority of our examinations, but that the cornea presents the surface of a tri-axial ellipsoid. On this surface we have two minor axes, at right angles to each other, of different lengths, with a major axis passing through the center of the cornea, corresponding to the optic axis. Each minor axis will represent the two principal meridians of the eye, with their respective planes, in which, I propose to note the refractive condition of each as compared with the radius of curvature of the anterior surface of the cornea, as shown by the ophthalmometer of Javal. Also some other important points that have been developed by this examination of the cornea.

Now, in the conditions proposed to be discussed by this paper it is not essential that we shall take into consideration the position of the visual line, nor that of the optic axis, nor the size of the angle "Alpha" as I think these two lines, being so near each other, may be considered as one in reference to these examinations. The examined

* Read before the Ophthalmic Section of the New York Academy of Medicine, March 15, 1897.

eye was directed towards the center of of the objective of the instrument used, so that these measurements were taken from the center of the cornea, with the visual line as the major axis and the two minor axes of our tri-axial ellipsoid, lying in the same plane as the iris, at right angles to each other.

I propose then to offer for your consideration the radius of curvature in the two principal meridians, be it either of a surface of revolution or that of a tri-axial ellipsoid, and at the same time to note the refraction of the eye in the planes corresponding with the meridians in which the radius was estimated and then to note the relation that seems to exist between the radius of curvature and the refractive condition of the eye.

It is well known, as demonstrated by Landolt, that the refractive condition of the human eye may be due, either, to the refractive power of the dioptric apparatus, or to the length of the optic axis, from the anterior to the posterior pole of the eye. These conditions, Landolt designates as *refractive* and *axial* ametropia respectively; but he considers that the largest number of examinations will show that the refractive condition is due to the optic axis being too long or too short, causing hyperopia or myopia, while in a much lesser number the refractive power of the eye is either too low or too high, causing the same conditions. In both propositions we find that the retina is so placed that parallel rays of light will fall upon that membrane either before or after they have come to a focal point. The principal focal distance does not lie at the plane of the retina.

From a study of the examinations as reported in this paper I note a decided relation between the curvature of the cornea and the refractive condition, even though we may find myopia with a long radius of curvature or hyperopia with a very short radius. But may not these examinations prove the rule?

Lauterbach, of Philadelphia, in the OPTHALMIC RECORD, March 1897, says: "The regular and systematic recording of the corneal curvatures is not only useful but is exceedingly interesting and often instructive, shedding light upon obscure conditions and presenting for solution new problems which otherwise had not even been recognized."

Before considering the results as shown by my examinations, it will be best to state the methods, by which the table of measurements was obtained.

In the examination of the refractive condition of the eye, I have based my results on both the objective and subjective methods: the

first, by the examination with the ophthalmometer, retinoscopy and the ophthalmoscope; and secondly, the examination of the visual power of the eye by the "trial by glasses" both with and without the use of a mydriatic.

Comparing the radius of curvature as obtained by Javal's instrument with the other examinations, which gives us the manifest and total refraction of the eye, in its two principal meridians, we can note the relation that seems to exist between the radius of curvature and the refraction.

In reference to the "trial by glasses" the ophthalmoscope and retinoscope I believe they are sufficiently exact, as I have practiced these methods for several years and I believe have become proficient so as to make these results comparatively correct, particularly so in the use of the retinoscope. I think that is one of the most exact and correct methods.

The entire examination is concluded by the measurements of the radius of curvature in the two principal meridians, as shown by the size of the object on the arc of the ophthalmometer, which gives us at the same time the radius of curvature in millimeters and fractions of a millimeter.

When I first commenced the use of Javal's Ophthalmometer in 1891, I procured an excellent imported instrument of E. B. Meyrowitz, which on examination and testing was found to be particularly correct in all particulars. The distal focal distance of the objective being 28 centimeters, with an exact doubling of the image of the object, so that the sides shall be exactly tangent to each other of an image 3 millimeters in diameter. The proximal focal distance was also 28 centimeters from the objective, with the eye-piece so adjusted that the crossed spiders web was exactly in focus and the object or mires, perfectly illuminated by a good steady light from a large window having a southern exposure. Under these conditions the radius of curvature was read off from the markings on the inner side of the arc and are sufficiently correct so as not to need the calculations necessary to find the radius by comparing the size of the object with the size of the image and the distance of the object.

When I first used this instrument I was instructed to note the over-lapping of the mires and from this to calculate the amount of the astigmatism, in diopters, with the axes as shown by the short pointers when the black line was continuous. But I soon noticed that the edge of the steps and parallelogram was more or less indistinct, so making

it impossible to estimate the exact doubling or over-lapping, particularly so in the smaller degrees of astigmatism. Also to allow one-half diopter when the astigmatism was shown to be "with the rule" and to add one-half a diopter when found to be "against the rule" made the final results uncertain. Hence I commenced to make my examinations and to calculate my results as shown by the size of the object. In other words, by the degrees as marked on the arc of the ophthalmometer, shown by the position of the small Mark on the slide of the steps. To do this, I first find the size of the object in the horizontal meridian by placing the steps so that the inner edge will just touch the parallelogram:—or we may say, two circles that the size will be just tangent to each other. The black line continuous and the larger pointer showing the meridian examined, while the small pointer shows the axis of the correcting cylindric glass in hyperopia, by the figures on the large disc.

In recording my observations I have taken the figures and measurements on the right hand side of the arc, which gives us the exact amount of astigmatism, and also to calculate the size of the object forming the image on the cornea, at the same time we may read off from the scale on the inner side of the arc, the radius of curvature in millimeters in the different meridians.

By this method we then note the size of the object, the radius of curvature and the amount of astigmatism. Then from the "trial by glasses," the retinoscope and the ophthalmoscope we have the refractive condition of the dioptric apparatus in the two principal planes, corresponding with the meridians.

These results I have recorded in my case book as follows:—R. E. $\frac{22}{23}$ 180. Now we find that 22 corresponds with a radius of curvature of 8.5 millimeters and 23 with 7.85 millimeters; hence the radius of curvature in the horizontal meridian is 8.5 m. m. and in the vertical meridian, 7.85 m. m. and that we have an exact doubling of a circle 21 centimeters in diameter in the horizontal and one of $21\frac{1}{2}$ centimeters in the vertical diameter.

It seems to me that this method of recording the findings of the ophthalmometer is very simple, easy and efficient from the many reliable data we may so easily obtain, giving all the information desired.

I will state that the following table of radius of curvature and refractive conditions is taken from my case books in my private office, that they were all carefully made, many under the use of atropin and I believe are practically correct.

CURVATURE OF THE CORNEA

Table comparing the radius of curvature of the human cornea with the refractive conditions, in the principal meridians.

Size of Object. Centimeters.	Radius. Millimeters.	Refractive Conditions.			Total Examina- tions:
		No. Emm.	No. Hy.	No. My.	
19	8.65		2		2
19 $\frac{1}{4}$	8.60		2		2
19 $\frac{1}{2}$	8.55	1	3		4
19 $\frac{3}{4}$	8.50	1	3		4
20	8.45	2	4		6
20 $\frac{1}{4}$	8.40		2		2
20 $\frac{1}{2}$	8.35	3	6	1	10
20 $\frac{3}{4}$	8.30	1	5	1	7
21	8.25	9	17	1	27
21 $\frac{1}{4}$	8.20	3	6		9
21 $\frac{1}{2}$	8.15	9	24	4	37
21 $\frac{3}{4}$	8.10	3	9	1	13
22	8.05	17	26	4	47
22 $\frac{1}{4}$	8.	10	6	5	21
22 $\frac{1}{2}$	7.95	24	26	9	59
22 $\frac{3}{4}$	7.90	20	11	2	33
23	7.85	21	43	3	67
23 $\frac{1}{4}$	7.80	21	34	5	60
23 $\frac{1}{2}$	7.75	26	45	10	81
23 $\frac{3}{4}$	7.70	21	32	4	57
24	* 7.65	21	44	7	72 *
24 $\frac{1}{4}$	7.60	20	29	6	55
24 $\frac{1}{2}$	7.555	30	36	13	79
24 $\frac{3}{4}$	7.55	18	19	6	43
25	7.50	26	32	14	72
25 $\frac{1}{4}$	7.455	6	22	5	33
25 $\frac{1}{2}$	7.45	4	21	20	45
25 $\frac{3}{4}$	7.40	8	9	1	18
26	7.35	14	17	9	40
26 $\frac{1}{4}$	7.30	5	3	4	12
26 $\frac{1}{2}$	7.255	6	7	2	15
26 $\frac{3}{4}$	7.25	3	1	3	7
27	7.20	7	4	11	22
27 $\frac{1}{4}$	7.15	1	1	4	6
27 $\frac{1}{2}$	7.10	2	1	1	4
27 $\frac{3}{4}$	7.05	2	1	1	4
28	7.	3	4	1	8
28 $\frac{1}{4}$	6.9555		1		1
28 $\frac{1}{2}$	6.955	1			1
28 $\frac{3}{4}$	6.95	2	2	1	5
29	6.90		2	1	3
29 $\frac{1}{4}$	6.75			1	1
30	6.70		2	2	4
30 $\frac{1}{2}$	6.655		2	2	4
31	6.50		2	2	4
Totals	- - - -	371	569	167	1106

Note: The figures in the first column refer to those on the right hand side of the arc of the ophthalmometer.

A careful study of this table will give us some interesting data, that may be of service in the examination of our cases. One of the most important that we notice is a certain definite relation that seems to exist between the radius of curvature and the refractive condition of the eye; even though we may note that in some cases, in which we have a very short radius and yet we find the refraction hyperopic, as we have two cases hypermetropic with a radius of curvature of only 6.5 m. m.; also cases in which the radius is very long and yet the refraction is myopic; we note three cases of myopia in which the radius is more than 8 m. m.; but I think that these exceptional cases may be considered as purely axial. The refractive condition must depend entirely upon the length of the optic axis. This must be very long in the myopic cases with a long radius of curvature and in the hypermetropic cases we have an extremely short axis that more than compensates for the short radius of curvature of the cornea.

In looking over my case book I also notice that among these examinations I found 178 measurements of 89 corneae, in which, the anterior surface was found to be a perfect surface of revolution consequently showing no evidence of the slightest degree of astigmatism.

In these cases the refraction was found to be either emmetropic or astigmatic "against the rule" others hyperopic or myopic. These cases are interesting as we find in Burnett on "Astigmatism" page 43—that in almost all his examinations he found a meridian of greatest and least curvature and says,—“In other words, the human cornea does not represent by its surface, the section of a sphere with equal radii, but approaches in form more nearly to an ellipsoid with three unequal axes.” Yet nearly one-fifth of my measurements presents this “section of a sphere with equal radii.”

Referring to our table we find that the radius of curvature may vary, from that of the shortest of 6.5 m. m. to the longest of 8.65 m. m. In this connection, I would mention one case, not reported in this table, in which I found a radius in the horizontal meridian of 7.4 m. m. and the refraction myopic of 2 D. and in the vertical meridian a radius of only 5.8 m. m. with the refraction hyperopic of 6 D. The ophthalmometer showing an astigmatism of 9 D. “with the rule” while the examination with the ophthalmoscope, the retinoscope and the “trial by glasses” gave just the opposite condition of refraction. This is shown by the final result, as follows:—R. E. V. $\frac{2}{3}\%$, W.—2 D. $\odot + 6$ D. cyl. ax. $170^\circ = \frac{2}{3}\%$. Also a case, reported by Dr. Dodd

and copied in the *Refractimist*, of astigmatism of 28 D. in which the radius of curvature was about 5 m. m. in the vertical, and about 11 m. m. in the horizontal meridian, or the extreme measurements that can be made on the ophthalmometer.

These are exceptional cases and are not referred to in this examination.

To resume the study of our table, the size of the object used or the distance between the edges of the mires, was $19\frac{1}{2}$ centimeters for the longest radius and $25\frac{1}{2}$ centimeters for the shortest radius, not including the above mentioned cases.

(TO BE CONCLUDED.)

CLINICAL HISTORY OF A CASE OF SUBCONJUNCTIVAL DISLOCATION OF THE CRYSTALLINE LENS.*

By CHARLES A. OLIVER, A. M., M. D.,

One of the Attending Surgeons to the Wills' Eye Hospital; one of the Ophthalmic Surgeons to the Philadelphia and Presbyterian Hospitals, etc

R. McA., a thirty-four year old housewife, applied at my clinic at the Presbyterian Hospital in Philadelphia with the history that two days previously she had fallen and struck her right eye against a projecting door-latch.

At the time of the first examination a lenticular shaped mass resting upon a tear in the sclera in the upper inner ciliary region could be plainly seen underlying the swollen and chemotic conjunctival membrane. The cornea was diffusely hazed and the anterior chamber was partly filled with blood. The iris was retracted and tremulous, its upper and inner quadrant being dragged out of sight backwards and inwards, producing a large coloboma. No fundus-reflex could be obtained.

The patient was admitted to the Hospital and carefully prepared for operation, which was done under as strict aseptic conditions as possible, by my assistant, Dr. William T. Shoemaker. The patient was etherized and the conjunctiva over the lenticular swelling was incised so as to allow the mass of unencapsulated lens-material to escape and to be extruded by the employment of a grooved spud. The scleral wound, which was cleanly cut, was not disturbed, as there was not any tendency for the vitreous to prolapse. It was not found necessary to place any conjunctival sutures in position. The field of

* Patient exhibited before the Section on Ophthalmology of the College of Physicians of Philadelphia, and paper read before the April, 1897, meeting of the Golden Belt Medical Society.

operation was thoroughly cleaned and protected with an occlusive dressing. In a few days the wound healed without a sign of inflammatory reaction.

At present the eye is perfectly quiet, the scleral scar is firmly united and but slightly prominent. The coloboma is unchanged. The haze of the cornea and the blood extravasations in the aqueous and vitreous humors have disappeared, allowing the undisturbed eye-ground to be plainly seen. The remnants of the torn capsule of the lens are faintly visible, just behind the upper inner border of the pupillary area. Vision with a properly correcting lens has risen to nearly normal.

REMARK:—The case is of interest for several reasons: the comparative rarity of the form of accident, the escape of the unencapsulated lens-material through the scleral rent into a single subconjunctival mass, the almost immediate removal of the lens-material without waiting for the tear in the sclerotic to unite, the avoidance of any retaining sutures, and the excellent result.

A MODIFICATION OF THE SIGHT-HOLE OF THE OPHTHALMOSCOPIC MIRROR.

By EDWARD JACKSON, A. M., M. D.,

Professor of Diseases of the Eye at the Philadelphia Polyclinic; Surgeon to Wills' Eye Hospital Philadelphia.

From the margin of the sight-hole in the ophthalmoscopic mirror there is always some light reflected, which produces the effect of a luminous cloud, more or less dense according to the amount of such light, through which all ophthalmoscopic examinations must be made. Holding the ophthalmoscope some distance from the eye the illuminated edge of the sight-hole is distinctly seen. Bring it close to the eye, and the light from it becomes diffused to form a luminous cloud. The reduction of the hindrance that this causes has been one important object aimed at by the makers of all ophthalmoscopes. Having the backing of the mirror thinned, and with an opening enough larger than the sight-hole in the mirror to prevent light from falling directly upon it; and having the margin well blackened, are precautions always to be carefully attended to.

Sight-holes are made either cut through the glass, or merely scraped in the silvering. When the sight-hole is cut through the glass it leaves an edge of glass which, even when carefully ground, reflects considerable light to the surgeon's eye. Thorough blackening

of it does not prevent some light from coming from this source. To reduce this the glass of the mirror is made as thin as possible, yet even in the best made ophthalmoscopes the reflex from the edge of the sight-hole has still been perceptible.

With the sight-hole simply made in the silvering, the glass being left intact, there is no such edge to reflect light into the eye. But dust collects upon the surface of the glass and causes the same trouble. From the front of the glass dust is readily and completely removed. But from the opening in the silvering, while it can be removed from the center, there is always left a ring of dust in the edge of the sight-hole, which reflects enough light to the eye to prove annoying; and this ring cannot be cleared away without sacrificing the margin of the silvering. In practice I have found that for the ordinary ophthalmoscopic examinations the sight-hole cut through the glass is preferable; while for the shadow-test, where the light falling upon the dust in the sight-hole is comparatively feeble, the simple removal of the silvering is better.

It occurred to me, however, that it would be possible to remove the objection to the latter plan, by cementing back of the mirror, a piece of glass, which should extend sufficiently beyond the margin of the opening in the silvering, somewhat as the "film" added to the main lens for "cemented bifocal" lenses. Messrs. Wall & Ochs, of Philadelphia, have made such mirrors for me. With them the light from the edge of the sight-hole is practically eliminated. The sight-hole is first carefully made in the silvering and examined to see that it is free from reflections. Then the thin piece of glass is cemented on the back. After this it is perfectly easy to remove dust from either the front or back of the mirror; and the sight-hole is permanently freed from annoying reflections. The plan was first used for the special form employed for the skiascopic examination; but it is applicable to any ophthalmoscopic mirror. For concave mirrors the piece cemented on the back must be as convex as the front is concave, or a lens effect will be produced.



MYOPIA DEVELOPING IN A ONE-EYED PATIENT.

By ALEXANDER DUANE, M. D.,

Of New York.

The subject of myopia and its development is of such paramount importance, that it seems worth while to put on record any fact, however slight, bearing upon the genesis of this affection. Hence I report the following case, believing that it must find a not infrequent parallel in the experience of others beside myself:

C. P. K., medical student, aged 21. R. eye, atrophía bulbi from panophthalmitis (presumably due to blenorrhœa) occurring at birth. Using for six years for L. eye $-3.50 \text{ } \ominus -1.75 \text{ cyl. ax. } 180^{\circ}$.

Under homatropin showed both by skiascopy and subjectively L. $-3.50 \text{ } \ominus -2.50 \text{ cyl. ax. } 5^{\circ}$. V. = $\frac{30}{80}+$. No crescent nor rarefaction, and L. fundus otherwise normal.

It has been argued that for the development of myopia, convergence is a necessary requisite. If this was so, myopia would not develop when, one eye being blind, no convergence is required. Anent this point one oculist of considerable experience has said that he has never known a one-eyed person to be myopic. That such a thing, however, is possible is proved by the case cited above as well as by another case, altogether analogous, which occurred in the practice of another practitioner and which I had the opportunity of observing.

SIGNIFICANCE OF THE CORNEAL REFLEX IN DIAGNOSTICATING POSTERIOR POLAR OPACITIES.

By ALEXANDER DUANE, M. D.,

New York.

ILLUSTRATED.

Dr. Weiland,* in his criticism of Dr. Jackson's article in the February number of the OPTHALMIC RECORD, appears to me to have missed the point at issue. It is true that, as he says, the position of the corneal reflex in general changes as the observer himself changes his position; but it is also true that this does not invalidate the fact that the apparent position of this reflex still lies in line with the center of curvature of the cornea and will, therefore, still be in line with and apparently cover an opacity situated at this center. A glance at the accompanying figure (Fig. 1) will make this clear:

* OPTHALMIC RECORD, April, 1897. See also Dr. Jackson's letter in this issue of the RECORD.

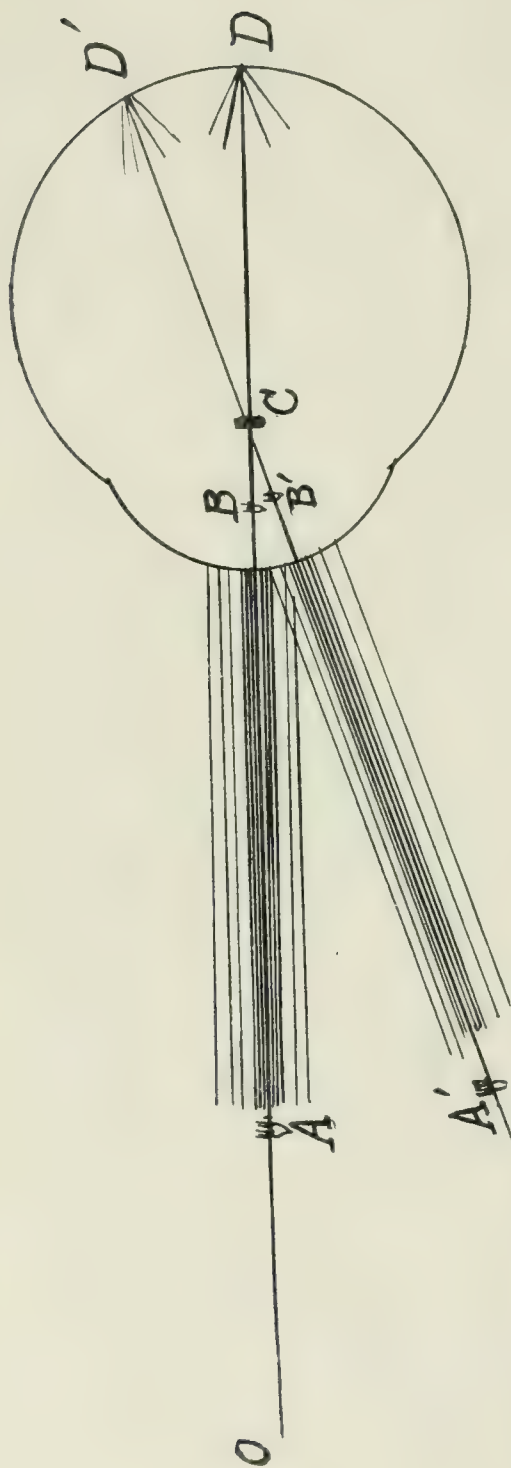


Fig. 1.

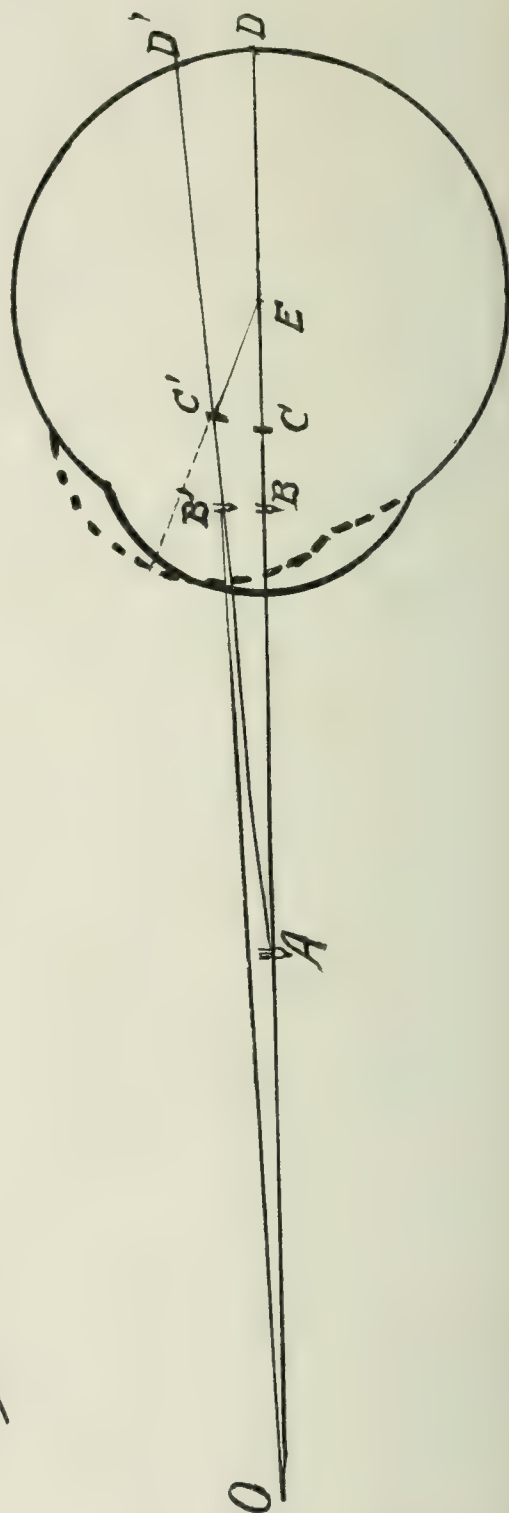


Fig. 2.

Let O be the position of the observer, A the (inverted) image of the flame, reflected by the ophthalmoscopic mirror and serving as the source of illumination for the cornea and for the interior of the eye. C is the center of curvature of the cornea, and is also, be it noted, practically

identical with the nodal point of the eye. B is the corneal reflex situated on a line with A and C, its distance in front of C varying, as Dr. Weiland says, according to the position of A. The rays emanating from A enter the eye and illuminate a portion, D of the fundus, the center of which is situated in a line with A and the nodal point of the eye (C). The rays emanating from D pass forward through the refracting media of the eye, and emerge, forming a convergent, parallel or divergent beam, which, according to the well-known law of projection, is directed towards the source of light (A). This beam coming from D is seen by the eye of the observer through the aperture of the ophthalmoscope and forms the red reflex filling the area of the pupil. Now, there being an opacity at C, the central rays of this returning beam are intercepted, and the observer sees a shadow in the middle of the beam, which shadow is evidently in line with D, C, and O, and hence with C, B, and O, i. e., with the eye of the observer and the corneal reflex.

Now suppose that the observer shifts his position to O'. The source of illumination for the eye (image of the flame reflected by the ophthalmoscope) shifts to A', the corneal reflex to B' (in line with A' and the center of corneal curvature, C), and the illuminated area of the fundus to D' (in line with A' and the nodal point, C). The rays emanating from D' will on emerging from the eye be directed towards A', and, as before, the central rays of this emergent beam will be cut off by the opacity at C. These intercepted rays are obviously in line with D' their point of origin, C the nodal point of the eye, and O' the eye of the observer. But, as B' is also in line with C and A' and hence with C and O', the corneal reflex in this case, as in the other, is in line with the shadow cast by the opacity, i. e., while the apparent position of the corneal reflex has moved with the shifting of the observer's position, the *apparent place of the opacity has moved with it*; both the opacity and the reflex, in fact, remaining in line with each other.

The same thing will take place *if the observed eye is made to rotate and that of the observer remains stationary*. Thus in Fig. 2, let O be the eye of the observer, A the source of illumination for the eye (image of the flame reflected by the ophthalmoscope), B the corneal reflex, C the center of curvature of the cornea, D the illuminated area of the fundus, and E the center of rotation of the eye. Suppose that the eye rotates through the angle CEC' , so that the cornea has the direction represented by the dotted line. Then the center of curvature of the cornea (and also the nodal point of the eye) will move from

C to C', the position of the corneal reflex from B to B' (in line with A and C'), and the illuminated area of the fundus from D to D' (in line with A and the nodal point, C'). Here again, the rays emanating from the illuminated areas of the fundus, D and D', will on emerging from the eye form beams, taking respectively the directions CA and C'A; and, as before, the central portion of these beams will be intercepted by an opacity situated at C (or C'), the nodal point of the eye. So that to an observer whose eye is at A the opacity will in the first instance appear to be in line with D, and hence also in line with B; and in the second instance, after the patient's eye has revolved through the angle CEC', will appear in line with D', and hence also in line with B', i.e., in this case the opacity would appear to be precisely in line with the corneal reflex in both positions of the patient's eye. Inasmuch, however, as the observer's eye is not at A but at O, the apparent position of the opacity in the second case will not quite coincide with that of the corneal reflex, the discrepancy between the two being represented by the angle OC'B' (an angle which, on account of its minuteness, has not been represented in the diagram. This angle, however, is, under all usual conditions, very small, so that, practically, the opacity and the corneal reflex keep pace with each other, even when the eye makes quite wide excursions.

Leaving all theory aside, we can say that, as a matter of fact, the value of this means of diagnosing the position of a posterior lenticular opacity (by its apparent coincidence with the corneal reflex) has long been recognized and the method itself has been habitually employed. Several have demonstrated its applicability. But it is remarkable that, although the test has been known for a long time, the principle upon which it rests should have been misunderstood by many. Thus when I first studied ophthalmology, I was taught that an opacity at the posterior pole of the lens remains stationary as the eye is moved about and that it remains stationary, because it is at or near the center of rotation of the eye. As a matter of fact, it is some 6 mm. in front of the center of rotation, and does not remain stationary, but shifts as the eye moves or as the observer moves. Nevertheless, this erroneous conception of the way in which the opacity behaves was not only taught orally, but is also to be found in various text-books, and erroneous deductions have actually been made from the theory as above enunciated.

Thus Soelberg Wells ("Diseases of the Eye," 4th American Ed., 1883, p. 762) makes the following very remarkable and erroneous statement: "If, for instance,

the observer (using the direct method) looks in such a direction that his visual line passes through the turning-point of the eye, it will be found that this point and the corneal reflection of the mirror will alone remain stationary when the eye is moved in different directions. Any opacity which is situated in front of this point will move in the same direction as the cornea, whereas any opacity situated behind the turning-point will move in a direction opposite to that of the cornea.

* * * *Now the turning point corresponds as nearly as possible to the posterior pole of the crystalline lens.* If there should consequently be an opacity situated at this spot (posterior polar cataract) it will remain stationary during the various movements of the eye. If the opacity is situated in front of the posterior pole, it will move in the same direction as the cornea; if the later moves upwards the opacity will do the same; the reverse will occur if the opacity is situated behind the turning-point. * * *

So also Loring ("Text-book of Ophthalmoscopy," Part I, p. 187): "When the observed eye looks directly at the hole in the observer's mirror, the visual axis of the observed eye coincides with that of the observer; and as the path of the illuminating rays is also in the same line, the corneal reflex will be seen in the center of the pupillary space, and will lie at the apex of the cornea; consequently the visual line of the observer will pass through the center of the reflex and also through the center of motion of the observed eye. These two points will, therefore, act as fixed points and always lie in the visual line of the observer, *the reflex because it lies in the path of the rays, which cannot change unless the position of the mirror changes*, and the center of motion because it is the point around which the eye rotates. For this reason an object situated in front of the center of motion will appear in reference to the corneal reflex to move in the same direction as the eye moves; if situated behind, it will move in an opposite direction. If the reflex covers the opacity, notwithstanding the various movements of the eye, *then the opacity must lie at the very center of the eye.*"

Loring, in this statement, quotes almost verbatim from Mauthner's celebrated treatise on Ophthalmoscopy. The failing point in Mauthner's and Loring's statement consists in supposing that, because all points of the cornea revolve equally about the center of rotation of the eye, the cornea as a whole does not shift its position, each portion of its curve pursuing a common path. This could be so only if the center of curvature of the cornea coincided with the center of rotation of the eye. The true state of the case is shown in Fig. 2, from which it is evident that both the surface of the cornea and its center of curvature change their places as the eye rotates, so that a line drawn from A perpendicular to the corneal surface and hence passing through the corneal center of curvature does not remain stationary. But the corneal reflex must be located somewhere along this line; hence the reflex cannot remain stationary either, and accordingly Mauthner's premises are seen to be invalid and his conclusions, therefore, are erroneous also.

The real explanation, however, is that the opacity, while shifting its place as the eye shifts, appears to an observer situated at the ordinary ophthalmoscopic distance to move as fast as does the corneal reflex, and the two being originally in line, continue to remain in line, no matter how the eye is rotated.

[Throughout this discussion of the relation of the corneal reflex to post-polar opacities it seems remarkable that no reference has been made to an article, published in the *American Journal of Ophthalmology*, Dec., 1890, and entitled "Differential Diagnosis of Opacities of the Eye." This was written by Dr. David W. Stevenson, at that time House Surgeon Illinois Charitable Eye and Ear Infirmary and now practising in Richmond, Ind. In the contribution Dr Stevenson controverts the statements of Mauthner and Loring, and clearly points out the same errors that Dr. Duane has exposed in these pages. This reference to Dr. Stevenson's work is all the more appropriate since we are, owing to lack of space, unable to publish an elaboration (recently submitted to us) of the views expressed in his earlier essay, where the value of the corneal reflex in the diagnosis of intra-ocular opacities is correctly estimated.

C. A. W.]

SARCOMA OF THE ORBIT.

By ROBERT SATTLER, M. D.,

Of Cincinnati, O.

Among the neoplasms of the orbit the sarcomata take first rank for malignancy. It is, unfortunately, an admitted fact that in spite of an early diagnosis, with prompt and radical surgical treatment, their course is inflexible and their termination almost uniformly fatal.

In exceptional cases, in which the growth is encapsulated, the early recognition of sarcomatous disease of the locality followed by immediate exenteration of the orbit, may bring about its disappearance. In a much larger proportion, however, it begins in the bone or its periosteal covering and is attended from the onset by vicious malignancy. Such neoplasms grow with incredible rapidity and reach enormous proportions. The most thorough removal, with or without resection of the bony walls, supplemented by the use of the galvano or thermo-cautery, does not even effect a retardation of growth; in many cases it only excites an increase of activity and rather hastens than otherwise, the inevitable lethal termination.

It remains an open question whether radical operative treatment is at all justifiable. The inflexible course of these treacherous growths has conclusively demonstrated the hopelessness of all surgical interference, even if practiced in accordance with most approved methods and resorted to during the incipient stage of the disease. For exploratory purposes, to determine the real character, location and attachment of the neoplasm and during the later stages to arrest excessive bleeding or relieve suffering, it may become an imperative measure of expediency.

It is positively unjustifiable and harmful if resorted to as a possible curative venture during the advanced stages of a rapidly

growing tumor of sub-periosteal origin, or one which has already infiltrated the tissues and walls of the orbit.

The real origin of sarcoma here as elsewhere remains obscure. The bony framework, periorbital lining and deep connective tissues of the orbit are the favorite seats and starting point for two of the most dreaded varieties of this disease (small round celled or encephaloid and and myeloid sarcoma).

Equally dangerous and unmanageable, attended by the most malignant characteristics are those varieties (glioma, glio-sarcoma,



Case I

melano-sarcoma) which originate as intra-ocular neoplasms. Unless speedily recognized and as speedily removed by enucleation, they burst through the tunics of the globe, invade and infiltrate the other structures of the orbit, attack the bony walls and adjacent regions and inevitably terminate fatally.

Less rapid in their course, but none the less fatal, are those varieties of sarcoma (osteo-sarcoma, alveolar-sarcoma) which originate

in the bones of the skull, face or adjacent sinuses and by extension infiltrate, displace and destroy the contents of the cavity.

The accompanying reports of cases refer to sarcomatous disease of the orbit in which the history and clinical evidence offer confirmatory evidence of its primary or intra-orbital origin. This was furthermore confirmed by surgical interference, which was undertaken either for exploratory purposes or as a relief or possible curative measure.

Case I. *Sub-periosteal pulsating medullary sarcoma in floor of left orbit. Rapid course; gigantic growth; duration six months; death. Metastatic deposits in brain cerebellum and internal organs. Operation—Exploratory operation, followed in two weeks by enucleation and exenteration of orbit. In eight weeks removal of tumor of enormous size with exenteration of cavity with thermo-cautery. In six weeks recurrence of growth, which steadily increased to enormous proportions.*

F. M., aet 9.—Well developed lad, with history of previous good health. For several weeks has been languid and listless. Three weeks ago first noticed swelling of left lower lid. No pain, glandular enlargement or cachectic appearance. Shortly after this, exophthalmos noticed with drooping of lid and diplopia. Globe displaced forwards and upwards. Palpation discloses a soft elastic mass which projects slightly beyond the inferior orbital margin and gives to the finger a feeble pulsation. An exploratory operation was advised. A free incision was made along and parallel to the inferior border of the orbit; and a soft growth under and upon the periorbita was found. An attempt to remove this without removal of the globe was impossible. Two weeks after this, exophthalmos steadily increased, and pain which had not been complained of before became almost constant. Radical surgical measures were then resorted to. The prominent globe was enucleated, and a thorough exenteration of the orbit, supplemented by the application of the actual cautery, made. The growth was very vascular and bleeding profuse. In eight weeks, amidst daily hemorrhages, the neoplasm grew until it projected like a huge mushroom beyond the orbital cavity. The suffering was so intolerable and bleeding so profuse that, as a relief measure only, the tumor was again removed. It was evident at this time that metastatic deposits and an extension to the brain had taken place. Death ensued in about five months from time of first exploratory operation. Post mortem examination revealed implication of bones of skull on the left side. The entire base of brain and cerebellum was converted into a soft sarcomatous mass, with metastatic deposits in lung, liver and spleen.

Case II. *Large sub-periosteal myeloid sarcoma of inner wall and roof of orbit. Death in six months after first local manifestation. Operation—Exploratory, followed by exenteration of orbit, etc.*

F. B., aet 25.—Family history negative. About two months ago noticed diplopia and swelling of left upper lid and shortly after prominence of left eye. This steadily increased with constant headache. Complained of lassitude. General health has always been perfect. Weight 180 lbs. Left eyebrow prominent owing to presence of elastic growth, which can be traced with the finger into and under the roof of orbit. Complains of dull pain in eye and entire left side of head. Anterior auricular glands enlarged. An exploratory operation advised and per-

formed. The eye was enucleated, and on exploring the cavity with the finger a sub-periosteal growth of great extent and very elastic was found

May 10, Tumor has returned, and assumed enormous proportions. As suffering was intense and at request of patient another operation was performed. A circular incision divided the soft part to the bone, and everything within this area, eyelids, adjacent skin, etc., removed, leaving the neoplasm exposed. This was removed, but remained inactive only a few days, and death ensued June 17. No post mortem was permitted.



Case II.

Case III F. S., girl, aet $3\frac{1}{2}$, W. Va.—Was brought with enormous prominence of left eye, and as result of the exposure perforation of the cornea had occurred. As a relief measure the globe was removed. It was then found that a soft tumor completely filled the orbital cavity. Owing to the weakened condition of the child radical operative treatment was not advised. It was made comfortable with anodynes and died four weeks after. The neoplasm reached the size of a large orange.

Case IV *Large tumor (sarcoma?) of right orbit. Duration three months. Metastatic deposits in brain and internal organs. No operation.*

A. W., aet 4, Ill.—Always a delicate child, but had had no serious illness until present one, which commenced eight weeks ago. Parents noticed a prominence



Case IV.

of right eye with drooping of lid. On examination an irregular soft mass was discovered, which almost completely filled the orbit. All motion of the globe was abolished. Stupor increased daily, with frequent paroxysms of vomiting. Operative interference unless suffering should become great was advised against. Three weeks after child died from exhaustion and metastatic deposits in brain.

Case V. *Encapsulated (?)*. *Soft round-celled sarcoma in floor and apex of orbit* Great prostration. Operation—*Enucleation and exenteration of orbit* Recovery.

Little girl, aged 4, was brought in a much emaciated condition and evidence of great suffering. The left eye was completely pushed through the lid commisure. Cornea hazy and devoid of sensation. Prominence of eye was first noticed eight weeks ago. Occasional vomiting. An exploratory operation was advised. The dislocated globe was removed, and a growth occupying the floor and inner wall of orbit was found. Palpation with finger led to the supposition that it had a capsule, and its removal was decided upon. Owing to its intimate attachment to muscles and periorbita it was impossible to remove it *en masse*. After thorough exenteration the periorbita was thoroughly scraped and seared with the cautery. Violent reaction with marked constitutional disturbance followed. This subsided and patient was sent home. Seven months afterwards word was received that the child was improving and the growth had not returned.

Case VI. *Sub-periosteal alveolar round celled sarcoma. Slow growth. Exploratory operation. Death in three and one half years.*

W. S., aet 53.—Three or four months before his first visit began to be unsteady in his gait, with slight diplopia. At this examination slight exophthalmos L.E. Motion of globe free. V. = 1. Ophthalmoscopic examination negative. On palpation a firm mass could be felt by pushing the finger between inner orbital margin and globe. Patient remained under observation for several months. He shortly suffered from a dull pain in temporal region, and exophthalmos increased. Motion of globe remained unimpaired. An exploratory operation was advised. The external rectus was divided, and an opening into the orbital cavity sufficient to admit the finger was made. It disclosed a hard sub-periosteal growth starting from the floor and walls of the orbit. Enucleation and exenteration of the orbit was done at once. Eight months after this the tumor again filled the orbital cavity and was very hard and firm. Owing to constant pain another operation was made. Owing to its intimate attachment to the adjacent bone, it was only by the use of chisel and mallet and rongeur forceps, that it was removed.



Case VI

In six months the growth returned and exophthalmos of the right eye commenced, showing that it had invaded the right orbit. Finally, amidst the greatest suffering, it pushed its way into the cranial cavity and death resulted. The dura

tion in this case was about three and one-half years. The tumor was found to be a typical alveolar sarcoma.

Case VII *Enormous osteo-sarcoma of left orbit. Destruction of eye from exposure. Operation refused. Death. Duration six years.*

A. G., aet 62.—Five years ago first noticed protrusion of left eye. Six months ago eye became painful and was destroyed by perforating ulcer, followed by panophthalmitis. From this time she suffered more severely from pain in head and orbit. The tumor filled the orbit and had infiltrated the frontal superior maxillary and malar bones. A large nodulated, very hard mass, about the size of two closed fists, projected through the lid opening. Operative treatment was advised, but refused. Patient disappeared, but I afterward heard that death ensued in six months.

Case VIII. *Osteo-sarcoma of walls of orbit. Enucleation and exenteration.*

A. G., aet 60.—Marked exophthalmos of left eye, with extensive ulceration and infiltration of the cornea from exposure. The presence of a firm tumor occupying the inner wall and roof of the orbit could be made out on palpation. Globe easily dislocated. Pain was constant and severe. For exploratory purposes and to relieve his suffering the globe was enucleated. A firm nodular mass occupying the inner upper and lower wall of the orbit was found. An attempt to remove this entire was unsuccessful, owing to its extensive attachment to the superior maxillary, frontal, ethmoid and sphenoid bones. The tumor slowly returned and its growth was uninterrupted until he disappeared several months afterward.

In addition to these cases of primary sarcoma in which it could be assumed that the neoplasm began as an extra-ocular growth in the deep tissues of the orbit, I have preserved the notes of six additional cases of large orbital neoplasms in which the origin could be traced to an intra-ocular tumor (glio-sarcoma or glioma).

The growth of this neoplasm after it had once perforated the tissues of the globe and infiltrated the tissues of the orbit, was most rapid. All were characterized by excessive malignancy, exuberant and rapid growth and speedily fatal termination.

Surgical interference was resorted to only at request of the parents, with neither hope or promise other than that it might mitigate the suffering and possibly affect a retardation of growth and delay for a brief period the fatal termination.

In my experience these expectations were not realized. The shock, hemorrhage and exhaustion following the operation rather precipitated a fatal ending, attended by more rapid growth and suffering. Five of these cases occurred in children, the youngest three and the oldest eleven years. The sixth in an old woman aet 60.

In the last case the diagnosis of intra-ocular sarcoma of the choroid and ciliary region was followed at once by enucleation. No

tumor could be discovered in the orbit, nor was the optic nerve infiltrated. In five months afterward the entire orbit was filled with a soft, inky looking sarcomatous mass. The neoplasm was removed at the request of the patient, but was followed by immediate return and deposits in the lungs and abdominal organs which resulted in death eight months after the enucleation.

The following are the five cases of glio-sarcoma:

Case I. A. W., aet $4\frac{1}{2}$.—Diagnosis: Glioma of retina, left eye. Immediate operation advised and at once resorted to. This led to the discovery of infiltration of optic nerve and tissues in apex of orbit, and was followed at once by exenteration. In three weeks return of tumor with steadily increasing growth, reaching the size of child's head at time of death, five and one-half months afterward.

Case II A. S., aet $3\frac{1}{2}$.—Diagnosis: Glio-sarcoma, left eye and orbit. Mucoid degeneration of neoplasm, sclera perforated in ciliary region; partial collapse of globe. Enucleation and exenteration of orbit, followed in three weeks by deposits in brain and death.

Case III A. T., aet 7.—Diagnosis: Glioma of retina, left eye. Prompt enucleation as preventive measure; followed in four months by exophthalmos of right eye and rapid growth of tumor in both orbits. No operation. Death in five months.

Case IV. May G., aet 11.—Diagnosis: Glio-sarcoma of left eye and orbit. Marked exophthalmos. Enucleation and exenteration; followed by almost immediate return of tumor, which reached enormous size before death occurred ten weeks afterward.

Case V. Frank M., aet 5.—Diagnosis: Glio-sarcoma of left orbit. Eye had been enucleated by an oculist for glioma of the retina. In less than six weeks afterward tumor filled the orbit. Operation at request of father. Exenteration and use of thermo-cautery. Death in four weeks.

The histories of the fourteen cases recorded emphasize the inexorable course and hopeless results attending even the most radical surgical treatment and furnish additional evidence that sarcoma of this locality must be regarded as one of the most dangerous forms of malignant disease.

Its occurrence in the cases enumerated, was not limited to any time of life. The most frequent period was childhood. Early adult life and the later periods were not exempt as several examples are furnished by the case reports.

The most treacherous neoplasms were those of sub-periosteal origin, characterized by an incredibly rapid course. Without exception they resented surgical interference by manifesting renewed activity, with increasing malignant properties. Cases 1 and 2.

Most insidious, so far as early manifestation, most rapid and destructive in their later stages and resembling those of sub-periosteal

origin in that more active growth was the invariable sequence of surgical interference were the glio-sarcoma of the globe and orbit. Cases 10, 11, 12, 13, 14.

With dread must the soft, pulpy, round celled neoplasms starting in the deeper connective tissues be regarded. Cases 3, 4, 5. The only hope that a lesser degree of malignancy may belong to these neoplasms, is that a capsule or connective tissue envelope may be found. Case 5.

So far as the course and duration are concerned, the histories show an inflexible course in all.

In childhood and early adult life an exceptionolly rapid course was the invariable rule, or an average of from three to eight months. During advanced life it was more protracted, extending in several cases over a period of several years.

Reviewing the results of surgical treatment, it will be seen that extensive and radical operative interference was practiced in twelve out of fourteen cases. In all of the twelve cases in which surgery was resorted to, it was done without delay and in the most thorough manner. In most cases the operation of exenteration was not limited to the soft parts, but the periorbita was removed and the bone curetted or removed with rongeur forceps, or it was supplemented by the use of the chisel, thermo or galvano:cautery.

If there was the slightest suspicion of infiltration of the lids or adjacent cutaneous areas, removal by excision was performed. In the last six mentioned cases surgical treatment was practiced at the request of the parents in five, and at the request of the patient in the remaining one.

These cases represent advanced stages of a vicious variety of sarcoma (glio-sarcoma). Surgical interference promised relief or a possible retardation of growth and at best only a delay for a brief period of the fatal termination. The reports of the cases show that not even this was accomplished.

This brings up again the cardinal question: Is radical surgery, exenteration of orbit with or without removal of eyelids, resection of bony walls, in a case of rapidly growing sarcoma of the orbit, a justifiable venture?

Should such cases be classed with the inoperable ones? And receive only palliative treatment, consisting principally of anodynes and enucleation of prominent globe as a preventive measure to suffering which sooner or later must occur; the use of the antitoxines of

erysipelas and the bacillus prodigious as suggested by Dr. Coley, etc.?

Certain it is that an exploratory operation can alone decide the advisability of radical operative measures. If this discloses a subperiosteal neoplasm, a soft infiltrating growth of the connective tissues and globe or an extensive implication of the bony walls, if in addition the duration is brief and the growth rapid, surgery should only be resorted to with a full understanding of its hopelessness and uncertainty.

It should never be practiced in a case of general sarcomatous disease in a child in which the orbital lesion is only the most conspicuous local expression of a simultaneous general infection, although enucleation is in most cases a recourse of beneficent expediency. All large and rapidly growing neoplasms of short duration, whether their origin be from the orbital tissues or walls or from an intra-ocular gliosarcoma, must be classed among inoperable ones.

Such cases are only converted into more malignant recurrent growths, and this is almost an unavoidable sequence of radical surgical treatment. These most favorable for operation are the encapsulated varieties of sarcoma. Unfortunately, however, this is rarely met with. An exploratory operation should in such a case be followed at once by speedy removal of the tumor, if possible without rupture of its capsule. This, however, is not always possible, because of the well-known secondary degeneration of these growths, their pulpy consistence, and owing to the fragility of the enveloping capsule. It should always be supplemented by complete exenteration of the orbit and even the use of the thermo-cautery. It should be the concern of the surgeon to make operative interference in this, the only variety of malignant sarcoma in which a chance to save life is offered, as thorough as possible.

THE PATHOGENIC MICROBES OF PNEUMONITIS IN DISEASES OF THE EYE.—A REPORT.

By JOHN E. WEEKS

Of New York.

The researches that have been made from time to time in regard to the pathogenic micro-organism in pneumonitis have developed the fact that more than one form exists.

In 1880 Steinberg injected some sputum from his own mouth under the skin of a Guinea pig and was surprised to find that the animal died after twenty-four hours. An examination of the

blood and tissues of the animal disclosed the presence of an encapsuled diplococcus. Later in the same year this micro-organism was described by Pasteur. Sternberg gave it the name "micrococcus, Pasteuri." This bacterium was studied later by Fränkel, who called it "micrococcus of sputum septicaemia." Other synonyms are *Diplococcus pneumoniae* (Weichselbaum), *Bacillus salivarius septicus* (Biondi), Lancet shaped micrococcus (Talamon, who found it in the rusty sputum of pneumonia), *Streptococcus lanceolatus Pasteuri* (Gameleis). This bacterium is not perfectly spherical but is slightly elongated, however it never occurs as a bacillus: One, two, three or more cocci may occur in one capsule. In secretion the capsule is present. In cultivation on artificial food media the capsule is absent. The coccus may develop in chains; it belongs to the streptococci.

The pneumococcus of Friedlander was discovered by Friedlander and Frobenius in 1883, having been found in the exudation in the pulmonary alveoli in croupous pneumonia. It consists of short rods of varying length, with rounded ends and is encapsulated. Flügge terms it a bacillus (*bacillus pneumoniae*). One of the marked differences between this and the diplococcus pneumoniae, is that Friedlander's pneumo-bacillus is discolored by the iodine solution used in Gram's method, while the diplococcus is not discolored but is stained well by Gram's method. Both micro-organisms produce death in twenty-four to thirty-six hours after being injected into mice.

A third form has been described by Flügge and termed *Bacillus pseudo-pneumonicus*. This bacillus has been observed by Passet in pus. It may readily be mistaken for either of the above described forms.

The first to mention the pneumococcus in connection with diseases of the eye was Sattler (Trans. Oph. Soc. Heidelberg 1885 p. 18) who observed it in the pus from two cases of dacryocystitis. Sattler tested the effect of the pneumococcus when introduced into the corneal tissue by incision and found that it produced ulcer and hypopion.

No further publication of investigations regarding the effect of the pneumococcus on the tissues of the eye or its relation to eye disease was made until 1893 when Gasparrini (Annal. d'Ottal. V. 22 p. 131) made known his experiments with the diplococcus of Fränkel (*Micrococcus Pasteuri* of Sternberg). His experiments were conducted on rabbits and were divided into four series. 1st Inoculations of the healthy conjunctiva. 2nd Effect of inoculation into the tissue of the cornea. 3rd Inoculations into the anterior chamber. 4th. Inocu-

lations into the vitreous chamber. No inflammation of the conjunctiva followed the introduction of the pure culture into the conjunctival sac without traumatism. Introduced into wounds of the cornea, corneal ulcer with hypopion followed in almost every case. When the germ in pure culture was introduced into the anterior or vitreous chambers panophthalmitis invariably followed.

Similar experiments were made by Perles (Virchow's Arch. V. 140 p. 209, who used the Friedlander pneumo-bacillus and also Fränkel's diplococcus (*Micrococcus Pasteuri Sternberg*) in fresh and old cultures. Perles arrived at conclusions similar to those of Gasparrini as regards the effect of fresh cultures on the tissues of the eye and further learned that old cultures possessed but little virulence although still retaining their vitality.

Bach (Arch. f. Augeneheilk. Vol. 31 p. 198, 1896) conducted experiments with the Fränkel-Weichselbaum pneumococcus (*Micrococcus Pasteuri Sternberg*) similar to those of Gasparrini. Of nineteen inoculations of the cornea, six were negative. Eight produced a grayish infiltration and five produced hypopion. Bach thinks that the tears soon destroy the virulence of the pneumococcus. He has never found this micro-organism in the normal conjunctival sac.

The experiments made with pure culture prove beyond a doubt the pathogenic qualities of the pneumococcus and pneumo-bacillus and clinical observations are not wanting to confirm the suspicion that the pneumococcus is the cause of certain eye affections. Gasparrini's remarkable paper (Annal. d'Ottol. Vol. xxii p. 332) gives the results of the observation of twenty-five cases of *hypopion keratitis* which occurred in individuals ranging from twenty-four to seventy years of age. In three of these cases, one of which was traumatic, no pneumococci were found; none of these cases were complicated with dacryocystitis. In all of the other cases the pneumococcus was present. In nine cases in which the corneal ulcer appeared with no history of traumatism, and in eight cases, traumatic in origin, dacryocystitis was present. In five cases due to traumatism no dacryocystitis was present. These observations would lead one to infer that the pneumococcus in a virulent condition may be found, with exceptional frequency, in the secretion in dacryocysto-blenorrhoea. Uthoff and Axenfield (Graefe's Arch. V. xiii. p. 1) report the observation of sixteen cases of "serpent ulcer" of the cornea, ten of which were complicated with dacryocystitis. The pneumococcus was present in all but one of the cases complicated with dacryocystitis and was present only in three of

the six cases that were not complicated with dacryocystitis. Here again the coincidence of the occurrence of dacryocystitis and destructive corneal ulcer, with the presence of the pneumococcus is striking. The researches of Mazet (*Annal. d'Oculistique* V. 113 p. 367) would appear to be against the theory of corneal infection, due to the pneumococcus from the pus of dacryocystitis, however it is not conclusive. Mazet has examined the pus from phlegmon of the lacrymal sac and has failed to find the pneumococcus in a single instance. If further proof of the presence of the pneumococcus in hypopion keratitis is required it is to be found in the paper by Basso (*internat. Med. Cong. Rome, V. vi, 1894*) who reports the examination of sixty cases in nearly all of which the pneumococcus was found and thought to be the cause.

A number of cases of *panophthalmitis* have been observed in which the bacteriological examination disclosed the presence of the pneumococcus. Gasparrini (1. c.,) reports four cases. One case followed Foerster's operation for the ripening of immature cataract in the presence of a very mild dacryocystitis. The pneumococcus was cultivated from the secretion from the lacrymal sac as well as from the pus from the eye. The second case was by infection through a staphyloma, with no dacryocystitis. The third occurred after hypopion keratitis with dacryocystitis; the fourth case followed injury, no dacryocystitis being present. Uhthoff and Axenfield report two cases of panophthalmitis following perforating ulcer of the cornea in which the pneumococcus was found. Ewetzki and Bereskew (*Rev. in Arch. of Ophthal. xxv no. 2, p. 267*) report a case of panophthalmitis after extraction, in which a bacillus similar to the bacillus salivarius septicus (Biondi) (*Micrococcus Pasteuri Sternberg*) was found. The same micro-organism was cultivated from the saliva and from the secretion from the lachrymal sac. Metastatic panophthalmitis occurring four days after the onset of pneumonitis of the left lung in a male patient 35 years of age, soon followed by symptoms of meningitis, is reported by Haushalter and Vilber (*Gaz. Hebdomadaire 1896 p. 321*). Death followed in fourteen days. The pneumococcus was found in the pus from the eye, in the meninges and in the affected lung.

According to Gasparrini (*Annal. d'Ottal. Vol. 23, 1894*) the pneumococcus is concerned in the production of some cases of *Tenonitis*. He reports one case in which the infection apparently extended from a marginal corneal ulcer; dacryocystitis and a mild form of conjunctivitis were present. Cultivations of the pneumococcus were obtained from the secretions from Tenon's capsule.

The pneumococcus was not mentioned as a cause of *conjunctivitis* until Morax recorded the observation of four cases in his excellent brochure, *Recherches Bact. s. l'etiology d. conj. Aiguës*. Paris 1894 p. 88. The cases occurred in children between the ages of eight days and four months. In each case but one eye was attacked. In every case a thin pseudo-membrane covered the tarsal conjunctiva. Bacteriological examination disclosed the presence of large numbers of a variety of an encapsulated coccus, which on cultivation and inoculation presented all the characteristics of the "Talamon-Fränkeli pneumococcus." (micrococcus Pasteuri of Sternberg) Morax in conclusion writes "Cette affection se rencontre chez les jeunes enfants. Elle peut s'accompagner d'un léger exsudat pseudo-membraneux." Since the observation of Morax the testimony confirming his conclusions regarding the agency of the pneumococcus in the production of a mild form of acute conjunctivitis has greatly increased but the belief held by Morax that the pneumococcus produced a membranous conjunctivitis has not been supported. Gasparrini (*Annal. d'Ottal.* Vol. xxiii p. 475) reports the observation of six cases of acute conjunctivitis due to the presence of the pneumococcus, two of which occurred in the new born and four in adults. Additional cases are reported in a later paper. Parinaud (*Annal. d'Oculistique* Vol. cxiii. p. 780) reports the observation of ten cases of a mild conjunctivitis occurring in the new born, in which there was but little swelling of the lids, with a muco-purulent discharge. Recovery without injury to the cornea followed. There was marked obstruction of the lachrymal canals in these cases suggesting the possibility that the starting point of the inflammation may have been in the lachrymal canals.

Two epidemics of muco-purulent conjunctivitis occurring in school children have been reported by Th. Axenfield (*Trans. Oph. Soc. Heidelberg*, 1896, (p. 140). In one of the epidemics, of ninety-four school children, eighteen were affected and six other individuals, not in school, were attacked. The duration of the affection was from one to five days. In one case the duration was ten days. Although young children are most frequently attacked Axenfield has observed the affection in one individual of fifty-six years.

The secretion from the conjunctiva in two cases was carried to the normal conjunctiva of three individuals and to the nasal mucous membrane of two persons with negative results. Axenfield believes that there must be a predisposition on the part of the individual before the conjunctivitis can be contracted and suggests that possibly a hyperne-

mia of the conjunctiva or a dacryocystitis must first exist. He also suggests that it is possible that the nasal mucous membrane must be first affected and that the conjunctiva is only a favorable extension membrane. He reports eight negative inoculations.

Gifford (*Arch. of Ophth.* V. xxv No. 3 p. 314) observed thirty-six cases of conjunctivitis in the secretion from which he found the pneumococcus. These cases occurred in individuals between the ages of nine months and thirty-five years. The attacks were mild with no corneal complications. Gifford instituted experiments to prove the contagiousness of pneumococcus conjunctivitis and claims to have been successful. Introduction of some of the secretion from a typical case of pneumococcus conjunctivitis into the conjunctival sac of his own eye resulted in the development of a conjunctivitis which was recovered from five days after the inoculation. Muco-pus conveyed from Gifford's eye to the eye of his assistant resulted in producing a conjunctivitis of an exceedingly mild type.

Experiments with the pure culture on serum agar, blood serum, and on albuminous-urine-agar were made without effect. An anaërobic cultivation was made on serum-agar and a few drops of the water of condensation, which contained many germs, was dropped into the conjunctival sac of a man of 23 years. The result was the production of an acute conjunctivitis. The trachomatous conjunctiva of a man aet. 43 years was inoculated in the same way with the same cultivation, an acute conjunctivitis supervened. In the inoculation of these cases with a second culture, there was one negative and two positive results. The cases being extremely mild. Gifford states that the period of incubation after the reception of the contagion varies from twenty-four to seventy-two hours. The more virulent germs requiring the shortest time to produce the disease.

The evidence collected is sufficient to establish the fact that the pneumo-bacillus of Friedlander is capable of producing grave ulcerative processes in the eye and that the pneumococcus of Fränkel (*Micrococcus Pasteuri* Sternberg) has been observed as the pathogenic micro-organism in cases of Tenonitis, panophthalmitis, hypopion keratitis, conjunctivitis and probably in some cases of dacryocystitis. The contagious nature of pneumococcus conjunctivitis, although probable, is not yet fully proven, nor is it yet a fully established fact that acute conjunctivitis can be produced by introducing into the healthy conjunctival sac pure cultures of the germ; further corroborative evidence must first be obtained.

THREE CASES OF INJURY TO THE EYE.

By S. B. MUNCASTER, M. D.,

Of Washington, D. C.

The following clinical histories are published because of their surgical interest :

Case I. A young student was brought to my office in 1895 by his father with the statement, that while loading a gun with powder he had been shot.

On examination about thirty pieces of powder were found imbedded in the cornea, conjunctiva and the sclera. The conjunctiva was torn in several places. About two hundred pieces of powder were found imbedded in the side of the face. A sol. of cocain and boracic acid, and one drop of 1 per cent. sol. of atropin were applied to the eye. All the particles of loose powder were removed with a piece of cotton on a stick dipped in hyd. bichlor., 1-5000, and the balance with a spud. Some of the particles that were in the conjunctiva were removed by cutting them out with a pair of small scissors, and in some places it was found necessary to cut away the membrane to remove those in the sclerotic. Those in the face were all removed with a spud. In six weeks the eye was entirely well, and no discoloration from the powder remained.

Case II. Mr. S., an electrician, came to my office in 1895. He was blind-folded. The following history was given : While standing beside a bench bringing down two wires charged with four hundred volts they touched near the bench by mistake, and as a result so vivid a light was produced that it caused him to fall backwards and he was rendered unconscious for several minutes. The bench was burned about two feet all around him. When he was raised from the floor all that he could see were "streaks of blood, rivers of blood, mountains covered with blood and rain drops of blood."

I made my room dark and examined to see if any foreign bodies were between the lids and if the cornea were injured. Cold applications were made during the morning, and as his suffering was intense a drop of 1 per cent. sol. of atrop. sulph. with boracic acid was placed in each eye, and he was sent home with directions to be kept in a dark room and continue the cold applications. When seen at six o'clock p.m. he was feeling considerably better, and I put a drop of sweet oil into each eye with directions that he be kept quiet for the night.

By the third day he could open his eyes a little. He improved gradually under treatment with $\frac{1}{4}$ per cent. sol. of eserine and boracic acid, and on the tenth day was able to go out with dark glasses.

At the expiration of two weeks he could stand an ophthalmic examination, when the retina was found to be perfectly normal, with the exception of a slight congestion.

Case III. I was called to the dispensary to see a young boy who was suffering from an injury resulting from explosion of a bottle that had been filled with powder. A piece of glass had cut the cornea extending 2 mm. outwards from the center and fully one-sixteenth of an inch through the sclerotic ; the aqueous humor had escaped and the vitreous was coming out of the wound, and several pieces of powder buried in the cornea. Some drops of 4 per cent. sol. of cocaine and a saturated sol. of boracic acid, and a drop of 1 per cent. sol. of atropin, were dropped

into eye, which then was washed out with a hyd. blchlor., 1-5000. I then removed the particles of powder and examined for fragments of glass, but did not find any. By this time fully one-eighth of the vitreous humor had escaped, and several persons who were standing near by said the eye was lost. After applying equal parts of iodoform and sweet oil and bandaging the eye, he was put to rest. The bandage was allowed to remain on until the second day. The lids were opened and the eye seemed to be in good condition. A few drops of boracic acid solution were applied and the eye re-bandaged. At the expiration of ten days the bandage was removed and he was able to count fingers at two feet. Dark glasses were ordered to be worn. In six months he could see almost as well as with the other eye.

CORRESPONDENCE.

THE USE OF THE CORNEAL REFLEX TO LOCATE OPACITIES NEAR THE POSTERIOR POLE OF THE LENS.

EDITORS OF THE OPHTHALMIC RECORD :

The note from Dr. Carl Wieland, in the April number, intended "to guard against the fallacies that might arise from the use" of the method described by me in the February number, reveals a complete misunderstanding of my paper. If this has occurred with so intelligent a reader as Dr. Wieland, it may have occurred with others, and requires a word of explanation.

Please note that I did not speak of the location of opacities *with reference to* the corneal reflex, but "*by means of* the corneal reflex." I say, "This paper, however, is written to call attention *to another point to which opacities can be referred with great accuracy* when they are situated near the posterior pole of the lens, or in the anterior vitreous, namely, *the center of curvature of the cornea.*"

Dr. Wieland says: "It is quite true that the line along which the observer, under these circumstances, sees the reflex runs through the center of curvature; but the corneal reflex itself, to which alone we refer opacities, does not lie at this center, but only on the line (secondary axis) at very variable distances from the former." When he assumes that it is "the corneal reflex itself to which alone we refer

to opacities," he assumes something entirely aside from the method I suggested. I spoke of using the ophthalmoscope, and ophthalmoscopic examinations are made with one eye, so that with them one is not conscious of the depth within the eye of the small image, which constitutes the corneal reflex. I made no reference to the *depth* of that image, only to its *direction*, which being always that of the center of curvature of the cornea, enables us, by their parallaxic movements to determine the relative depth of the center of curvature of the cornea and the opacity.

Submitting the above to Dr. Weiland, I received the appended note, which may serve to make the subject still clearer.

Respectfully,

EDWARD JACKSON.

DR. E. JACKSON :

DEAR DOCTOR :—You are quite right ! Too late did I recognize that I had misunderstood you. But I had hoped that I would get a proof and then rectify matters. A proof, however, I did not get, and as I had not seen the *RECORD* of April I forgot all about it. The point is this : I supposed that you referred to the *relative* movement of the corneal reflex and the opacity with reference to each other, to see which was behind the other. In this case of course a knowledge of the depth of the reflex would be necessary, and it would require such an arrangement of light and ophthalmoscopic mirror that the corneal reflex would seem to be at the center of curvature.

But you regard the matter from quite a different standpoint. You refer the movement of corneal reflex and opacity to the *pupil* and project both movements as it were on the pupillary plane ; and then, all you say is correct.

I am sorry I misunderstood you, and that the more as a second careful reading of your article shows that there was hardly a possibility of a misconstruction. But the preconceived idea that you observed only the movements of reflex and opacity with reference to each other (which of course would be another possible way) and not with reference to the pupil, was too strong at that time.

You are at liberty to publish these lines in the *RECORD* if you so desire.

Yours truly,

CARL WEILAND.

REVIEWS.

VISUAL FIELD MEASUREMENT BY THE DARK PERIMETER.

Wilbrand in a lengthy article in the January number of the *Monatschrift fuer Psychiatrie und Neurologie*, gives an exhaustive description of his dark perimeter, and advances very cogent reasons for its general and frequent use.

The following is an abstract of his elaborate paper.

The perimeter itself is of the usual hemispherical type. It is used in a dark room, hence the test objects have to be luminous. For this purpose he uses a small globule of phosphorescent material, the size of a pin head. It is just bright enough to arrest the attention without illuminating the surrounding space.

Far more accurate information as to the visual field can thus be obtained than with the ordinary perimeter in diffuse daylight.

In the latter perimeter the size and brightness of the white test object prevent any delicate results with the test. If an individual with normal eyes be suddenly brought into a dark room from the diffuse daylight, and be tested by the dark perimeter, quite a marked contraction of his visual field will be found. After a short rest in the dark, if the examination be repeated, the field will be found normal in extent.

If the exposure to daylight has been long or if the light has been very intense, the contraction of the field will be found greater and the time required to reach the normal limits will be longer.

Hering calls this the recovering of the retina. The retina is fully recovered when there is no further increase of the light perception but as soon as it is again exposed to diffuse daylight, there is a fall in its efficiency, so slight indeed that it escapes our attention unless looked for as mentioned above.

A common example of this recovery of the retina can be observed by anyone on going from bright diffuse daylight into a semi-dark room; at first nothing can be seen, but soon objects appear with increasing clearness. Aubert calls it the adaptation, not recovery of the retina.

Of clinical import is the time required for the entire recovery of the retina. This varies even in normal eyes, much more so in eyes with

functional and organic lesions. When certain portions of the retina are affected, they will require longer time than other portions to recover, etc., etc.

The cones contain the visual substance. The ethereal waves of light produce a chemical decomposition of this substance.

This chemical action in turn stimulates the centripetal nerve fibers running to the cerebral centers and gives rise to the psychical perception of light.

This action on the visual substance can be called the katabolic action.

An anabolic action likewise occurs at the same time, *i. e.*, a reformation of the visual substance. This goes on more rapidly in the dark and restores the perceptive power of the eye for light. The psychical correlative for this anabolic change is the perception (if one may so say), of darkness.

It is upon the proportion of the katabolic to the anabolic change going on at any one time that the relative clearness or darkness of an object depends. If the katabolic be in excess the object is clearer and *vice versa*.

After a sojourn in the dark, the katabolic and anabolic processes reach a certain stage, beyond which no further changes occur. The retina shows no further increase of its light perception; a condition of equilibrium exists, called, by Hering, autonomous equilibrium, and the equivalent light perception "neutral grey."

With this there are always varying spots, where, from some internal stimulation, slight deviations from this condition of equilibrium occur, followed rapidly by a return to equilibrium, thus producing the effect of clouds and clear areas in the grey.

The dazzling that occurs on going from the dark into diffuse daylight is due not only to the amount of light entering the eyes, but to its effect on the hyperaccumulation of visual substance that has taken place in the dark, hence the sensation of extreme clearness, or dazzling, which gradually disappears as the visual substance undergoes its katabolic change.

As the visual substance exists in the cones, its distribution varies with that of the cones, being most marked at the macula and least at the periphery of the retina.

Hence, in examination of the eye with the dark perimeter after exposure to the light, the whole retinal light perception is diminished, and most markedly is it noted at the periphery of the field which

is contracted, but on repeating the examination after a rest, the field is found gradually to extend until it has reached the normal extent and the condition of retinal autonomous equilibrium exists.

It is found also that when the light perception is diminished, the field for colours is also contracted, and one marked peculiarity is that the limit for red perception coincides with, or even extends beyond the limit for blue, the opposite condition to that found in the normal field and which must be due to the lesser luminosity of the blue as compared to the red colour. The same condition occurs in hysterical cases.

The reason why with a white test object of 5 m. m. in the ordinary perimeter in diffuse daylight, the tired retina shows little or no contraction of the light perception, in extent, etc., is that the white object is too luminous and unless the retina be very greatly depressed the finer variations can easily escape detection.

Hence a grey, not white object should be used, but the perception of this would vary so with different degrees of brightness of the atmosphere, that the same degree of greyiness would not answer always, hence a great factor of uncertainty appears. The only way to overcome this would be by the dark perimeter as used by Wilbrand.

Wilbrand formulates the rule that "The absolute extent of our visual field can only be determined by the smallest and least luminous object which can be perceived by the most peripheral cone of the retina."

Since the cones are the perceptive element and are distributed generally over the retina, it is evident that if any one portion of the retina be especially stimulated as for instance gazing at a small white object for some time, this special area will have its light perception much diminished, as compared to the surrounding retina. This shows up very clearly in the dark perimeter as a delicate scotoma, and curiously the rest of the retina is also found to have its light perception diminished but to a much less extent. The whole of the visual substance being called to bear a share of the stimulation.

In ordinary every day life we do not perceive this depression of the retinal function, because the anabolic processes occur as rapidly as the katabolic and there is always a sufficient amount of visual substance ready; also on account of the constant movement of the eye and body the stimulated area of the retina is constantly being shifted, so that a portion of the retina which is brilliantly illuminated one moment is not so the next. In addition to this, Hering's law of sim-

ultaneous contrasts comes to be considered, according to which at the boundaries of the more highly illuminated areas, the visual substance is accumulated in fuller masses, so that this area appears subjectively even dark.

If we fix continuously and most exactly one certain point of an illuminated body, in a short time, we will notice this spot and its surroundings gradually becoming fainter, until the whole finally disappears in an even grey cloud, which extends from the periphery into the fixation point. In order to observe this the head must be held absolutely still.

Through the continuous katabolic process necessitated, there has been a fall in the perception of light.

Since now on the entire surface of the retina images of objects in space are thrown and on the borders of these more clearly illuminated retina areas, there is according to the law of simultaneous contrast a heaping up of the visual substance, so now in the less illuminated areas the light that does enter, together with the antonomous katabolic process give rise in time to an increasing clearer light perception. This continues until such a time as at the bright fixation area the anabolic and katabolic process will have reached the condition of allonomous equilibrium and, the same occurring over the rest of the field, there is a mere perception of grey. In other words there is a gradually diminishing clearness of light perception at the fixation and a gradually increasing over the rest of the retina, so a time comes at which they are exactly similar.

This allonomous equilibrium differs from the autonomous in that as soon as the eye moves and the image falls on a new area of the retina it disappears.

We rarely or never notice this condition as it requires prolonged, absolutely steady fixation.

In our usual occupation, by moving our eyes, winking, &c., the anabolic process can preserve such a ratio to the katabolic that the diminished activity to the retina is so slight as to escape notice.

If from any cause the reproduction of the visual substance be delayed or diminished, there is then a rapid fall in the acuity of the retina.

Whilst the normal eye requires but a few minutes sojourn in the dark to record on the dark perimeter a normal field, on the other hand in an eye in which the reproduction of the usual substance is delayed or prolonged, it may require some hours to enable the field to reach its normal limits.

This marked inefficiency of the retina is noted in organic lesions of the eye or optic nerve, as well as in functional organic disturbances.

But in the former by examination with the dark perimeter, although the field may slightly improve after a long sojourn in the dark, the scotoma corresponding to the lesion shews up well and far more sharply than if the examination had been done in daylight by the ordinary perimeter.

The very slow recovery of the retina in functional nervous visual disturbances manifests itself in varying conditions, from slightly sub-normal to a most intense degree of inefficiency, so that even after several days in the dark the field has not reached its normal extent with the 5 m. m. test object, but if a brighter or larger one be used then the normal extent can be reached.

A concentric limitation which requires a half to one hour's rest in dark to show normal limits by the dark perimeter, would in diffuse daylight by the ordinary perimeter show but very faint contraction. In the latter case however, another characteristic symptom would show up; rapid tiring and increasing field contraction in prolonged examination by the perimeter.

The limitation of the field of medium grade found by the ordinary perimeter in daylight requires several hours rest in the dark before the normal limits are reached in testing by the dark perimeter, that is, in other words, until the retina has completely recovered itself.

As compared to the field in organic lesions, there is in the peripherally limited light perception of functional nervous troubles, no absolute obliteration of the light perception only an obtunding, hence in ordinary daylight, locomotion, &c., is not interfered with.

In these latter cases the fields for colour are limited, sometimes very markedly simply because the colours are faintly luminous. The limit for red either coincides with that for blue or overlaps it, the opposite to the ordinary condition.

This being due to the well known physiological fact that the red is perceived more clearly than blue in the central areas of the retina in cases of marked inefficiency of the retina.

This rapid diminution of the light perception in inefficient retinae is due either to deficiency in quantity or in quality of the visual substance, or both. Fever, defective nutrition, blood changes, chronic poisoning, &c., cause it.

That these metabolic processes occur in the eye itself and not behind in the optic centres is sustained by the following reasons:

1. Functional nervous visual disturbances never occur in a hemianopic form, as they would have to, if the lesion were behind the chiasma, the seat of the semidecussation of the optic nerve fibres.

2. The phenomenon of concentric visual field contraction, does sometimes occur in one eye only, get worse and then improve independently of the other eye.

3. The general mass of symptoms, viz: dazzling in diffuse daylight, better vision on dull days, cloudy vision in sunshine, easily occurring cloudy vision, photopsia, much better vision after complete recovery of the retina, varying acuteness of central vision, easy tiring of the eye, rapid disappearance of any object fixed. These are complained of both by hysterical cases, cases with functional nervous trouble and by genuine cases of tabetic atrophy.

In a case of atrophy, if we first take the field in daylight and again after several hours rest in the dark we will find the latter field more extensive than the first, but the areas corresponding to the atrophied nerve fibres show marked scotomata.

Now, as to the explanation of these two sets of similar symptoms. In the optic nerve are two sets of fibres, the centripetal and the centrifugal. The centripetal originate in the cones, then pass up the optic nerve, undergoing partial decussation at the chiasma. These terminate at the basal optic centres, from which fibres run to the cortex. These fibres conduct the stimuli which give rise to the sense of sight in the brain. Lesions between the eye and chiasma would give rise to defects in one eye; if behind the chiasma, to hemianopic defects.

As to the function of the centrifugal fibres, the rods in the retina, as is known, stand in close relation to the preparation of the visual substance and the pigment epithelium.

These rods are the terminal organs of the centrifugal fibres which originate in the anterior corpora quadrigemina and corpora geniculata externa.

Wilbrand holds that these fibres, which are intimately fixed with the centripetal fibres in the optic nerve, produce from the rods the particular material which mixes with lymph stream circulating round the cones, and which is used up in the reproduction of the visual substance in the cones.

Any lesion of the optic nerve must then, by causing loss of centripetal fibres, give rise to an absolute defect in the field vision, and, by lesion, of the centrifugal fibres, cause a corresponding loss of

rods, and hence a diminution of the total amount of material for the production of visual substance, which material, as we have just seen, is produced by the rods and circulates in the lymph stream.

In the case of optic atrophy in tabes after long sojourn in the dark, when the eye is suddenly exposed to diffuse daylight the katabolic changes occur more rapidly than in the normal eye, because of the partial failure of the anabolic processes, due to the loss of so many rods and the diminution in the total amount of the repair material for the visual substance.

These eyes then rapidly fail in their light perception on exposure to diffuse daylight, and have to sojourn in the dark again before they can recover.

Further examination with the dark perimeter will show scotomata corresponding to the areas supplied by the atrophied nerve fibres.

Lesions in retina and choroid give rise to the same symptoms.

Clinical results point in the case of centrifugal fibres to a total decussation of them, or else to the fibres to one eye coming from the cerebral hemisphere of the same side.

Especially does this appear likely when we consider cases in which only one eye suffers from concentric limitation of the field of the functional type. The seat of the lesion giving rise to this functional nervous contraction of field must be the centre for the centrifugal figures, a restricted action of this centre occurring.

In hysteria, restricted action is apt to occur in the most diverse areas.

In this case the restricted action would result in deficient production of the material for the visual substance of its deficient quality.

These fibres route from the cortex to the centres, must be separate from that of the centripetal fibres, otherwise then hemianopic defects due to lesions of the centripetal fibres would, if the centrifugal fibres were affected, show also concentric contraction of field which does not occur.

The explanation of Nyctalopia, in nervous asthenopes, *i. e.*, better vision in dusk, and worse in clear sunshine, is easily declared from the foregoing statements. It is due to the retarded reproduction of the visual substance and hence the rapid unopposed katabolic processes. The uncomfortable feeling which the dazzling causes, is due to the irritation of the ciliary nerve terminals in the choroid by the temporary and unusual accumulation of the katabolic product, until the eye has rested and the anabolic process evens up to the katabolic.

The same thing occurs when after a sojourn in the dark, the normal eye is exposed to bright daylight. The sudden destruction of

over accumulated visual substance causes it, the process being very rapid and intense, this continues until the retinal light perception has fallen a little below par, when the condition of equilibrium occurs.

The nervous asthenopic eye can only recover its tone, or try to do so, by frequent winking or by wearing dark glasses, by this means the katabolic processes are diminished, and the anabolic assisted, hence these patients see fairly well in the dusk or with dark glasses. If the eye be again exposed there is a rapid increase of the catabolic processes, a dazzling feeling, a rapid fall in the retinal efficiency and a corresponding diminution of the central visual acuity.

In advanced tabetic optic atrophy, there occurs a grade of retinal inefficiency after exposure to diffuse daylight which appears as almost absolute blindness.

After prolonged rest in the dark and then testing by the dark perimeter, a very contracted field will be found, and what is surprising the previous immobile pupil will now react to light.

This is of course very transitory and the fall to amblyopic or amaurotic stage very rapid on exposure to light.

It is found after a total optic atrophy that the rods and cones yet appear normal. By the loss of so many centrifugal fibres, the reproduction of the visual substance, by the rods, as a whole is greatly diminished. The action of the light causes a destruction of this visual substance for *all* the cones, hence there must be a diminished amount for each one, and among these cones only a few are now connected with functionally active centripetal nerve fibres. These few fibres conduct the impulse not only to the optic centres but to the pupillary centre. Hence only a trace of light is perceived and a corresponding failure of the pupillary reaction. Rest in dark allows a slow anabolic process to go on with the result of at any rate contracted field, and corresponding pupillary reaction to very bright illumination.

If all the optic nerve fibres atrophy, then there is entire loss of function in the rods and cones, which latter however do not alter in appearance, as they receive their nutriment from the choroid.

With the exhaustion of the visual substance in the cones, total blindness insues and loss of pupillary reaction.

One important diagnostic point as to the pupillary reaction is this: if in cases of pupillary immobility there is, after a rest in the dark, a return of its reaction to light, the lesion is surely not in the pupillary nucleus and the converse also holds.

J. W. STIRLING.

REPORTS OF SOCIETIES.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

Regular meeting held May 11, 1897, Dr. Montgomery in the chair.

Dr. Casey Wood showed a little girl, 13 years old, an hysterical subject, who had suffered for years with asthenopic symptoms and poor vision. Many examinations had been made of her eyes and their functions. The fields for white were characteristically contracted and inverted, the color fields being larger than that for white. Both distant and near vision, without a glass, was very poor, usually $\frac{2}{7}$ and Jaeger xii in each eye. A plane glass, however, in each eye brought the vision, near and far, to normal. When the glasses were raised the child positively could not read the coarsest print, but with the glasses read Jaeger 1 with facility. This case also responded to the tuning fork test of color, different tuning forks causing different colors to appear, and the results were constant. She was now attending school and seemed to have lost her asthenopia. Treatment had been galvanism and suggestion.

Dr. Prince reported the case of a young man of 17, who had been stung on the upper eyelid by a bee. Some swelling of the lid followed and the local physicians recommended that the eye should be removed fearing that poison had entered the orbit and was traveling up the optic nerve. Dr. Prince, seeing the patient some three or four days after the accident, found the eye totally blind. No changes could be made out in the fundus and a diagnosis of hysteria was made. After a number of weeks treatment in the way of placebos and repeated attempts with green and red glasses the patient was persuaded that he could see. While in the hospital another patient was operated on for ptosis, and this patient soon acquired the same condition. A slight incision was made in the skin and a stitch put in and the ptosis disappeared.

Dr. Prince also reported a case of a lady who had a great dread of catching cold in her eye and had been under treatment for a long period for conjunctivitis. This patient was cured by being exposed to a strong draught and persuaded that she could not take cold in her eye. A third case was in a child of 8, whose fields were reduced to 10° . With an astigmatic correction the fields became normal.

Dr. T. A. Woodruff presented a girl, 13 years of age, with 3 D. of oblique astigmatism, whose corneæ showed a marked difference between the longer and shorter diameters and where the ellipsoidal shape of the astigmatic corneæ could be well seen without the aid of any keratometer.

Dr. Beard showed five cases of plastic operation with very beautiful results. The first case was in an elderly woman whose lower lid and outer third of the upper had been removed for carcinoma. New lids were made by a sliding flap taken from the cheek. The operation was made two years ago and there had been no return of the carcinoma. The second case was in a little girl whose face had been badly burned so that a very extensive cicatrix drew both lower lids down on the cheek. Flaps an inch and a half wide and two and a half long were taken from the arm and transplanted. The third case was an operation for ptosis. The essential point of the operation was in attaching the upper border of the tarsus to the deep fascia at the upper edge of the orbit. The result was perfect. The fourth case was in an elderly woman, and the ectropion was caused by an extensive caries of the lower floor of the orbit. Four chiseling and scraping operations were done on the bone, and extensive flaps from the arm grafted. The fifth case was one of entropion from trachoma. The operation was a modification of that devised by Dr. Hotz and combined the grafting of a strip of mucous membrane from the lip with the lifting of the tarsus and attaching it to the deep orbital fascia.

Dr. Pinckard reported a case of double hysterical amaurosis. The patient was a woman of about 36, suffering from a pelvic disorder. She was attacked with violent pain one afternoon, for the relief of which small doses of morphine were given. She awoke that night totally blind. Dr. Pinckard first saw the case three days after the attack. No lesion could be reported in the fundus, and a diagnosis of hysteria was made. A placebo was given, and the patient was told that on the next day she would be able to see. Her vision returned the following day.

Dr. Wescott spoke of a case of hysterical blindness following pregnancy which recovered in a few days.

Dr. Gradle reported two cases of hysterical amblyopia in middle-aged men which had lasted for years and refused to yield to any kind of treatment, although many different methods had been tried for their cure.

C. P. PINCKARD,

Secretary.

SECTION ON OPHTHALMOLOGY,

College of Physicians of Philadelphia.

Meeting April 20, 1897. Dr. Wm. F. Norris, President, in the chair.

Dr. E. K. Perrine reported, by invitation, a *Case of Intraocular Tumor*. A married woman, aged 61, presented herself at the German Hospital April 10, 1897, complaining of excessive pain and neuralgia in the left eye that had continued for five weeks and caused frequent nausea and vomiting. The eye had been previously free from pain, although sight had been failing for twelve years, and for the past year had been entirely lost. The right eye is normal in every respect. Left eye: ptosis and edema of the upper lid, hyperemia of the conjunctiva, engorgement of the anterior ciliary vessels, steaminess and punctate opacity of the cornea in its upper half, and slight loss of sensation. The inner half of the anterior chamber is filled with a mass that has pushed the iris forward in contact with the cornea and extends from behind it in the pupillary space. The growth is of a dark brown color, smooth and rounded. The bulging iris is atrophied at the ciliary border where the growth appears to be attached, but is not ruptured. The margin of the iris on the temporal side reacts to light, and when dilated with atropin shows the lower border of the tumor, between which and the edge of the pupil the opaque shrunken lens, dislocated backward, can be seen. T. + 2. The patient has twelve living children and has always had good health. There is no family history of eye troubles or tumors. The growth is probably a primary melanosarcoma, originating from either the anterior portion of the ciliary body or the posterior surface of the iris. The case illustrates the extremely slow growth of some forms of melanosarcoma as compared with other malignant neoplasms and the very late appearance of secondary glaucoma.

Postscript.—After enucleation macroscopic examination showed a dark-brown mass the size of a pea, the diameters varying from 3 to 5 mm., attached to the ciliary body and iris and a shrunken and opaque lens dislocated backward. No other growths could be distinguished.

Discussion.—Dr. H. F. Hansell believed that increased tension in the case of tumors within the eyeball was not dependent upon the increased amount of material or the alterations in the character of the contents of the ball, but to nutritive changes that induced secondary glaucoma. For this reason plus tension is a late sign of the disease and its absence may not be a contraindication of the presence of an intraocular neoplasm.

Dr. S. D. Risley has found that tension alternates,—sometimes it is high and again it is lower, the latter especially after the tumor has perforated the coats of the ball.

Dr. W. M. Zimmerman reported that, in the case he had exhibited to the Section in March, during the time the patient was under observation—ten years—the tension had not been raised.

Dr. G. C. Harlan called attention to the absence of change in the corneoscleral border as a strong point in favor of the stroma of the iris as the starting-place of the tumor. In speaking of the relief from pain by instillations of eserin, the common practice in glaucoma, he had known duboisia given by mistake in one case of well-marked acute glaucoma completely efficient.

Dr. W. F. Norris said that it was well known that the atropia does not always increase tension.

Dr. Edward Jackson reported three cases of *Transient Lesions of the Retina and Choroid from the Bruises of the Eyeball*, similar to the case he had reported to the American Ophthalmological Society in 1888. In each case the injury had been severe enough to cause some marking of the lids or eyeball. Impairment of sight was noticed immediately, and examination showed edema of the retina with yellowish rounded spots of choroidal exudation. The haziness of the retina cleared up within 24 or 48 hours. The choroidal spots faded away in from three days to a week, each being followed by an area of redness. In three of the cases that had been observed long enough recovery was complete. He called attention to the fact that, although the retinal changes had been described by other writers, in these cases the choroidal lesions were quite as marked and more permanent; and that the choroidal changes were distributed in the arc of a circle or circles, having the center at the optic nerve entrance. In only one of these cases was retinal hemorrhage detected.

Discussion.—Dr. G. C. Harlan remembered the first case referred to by Dr. Jackson and was inclined to believe, from the ophthalmoscopic appearances that there were minute ruptures of the choroid.

Dr. Edward Jackson spoke of the method of *Preserving Ophthalmic Specimens* in formalin solutions, recently published by Mr. Priestly Smith, and showed specimens so mounted. The advantages of the method are the great ease with which specimens may be permanently preserved in the best condition for inspection, and the fact that it is always available for microscopic examination.

HOWARD F. HANSELL,
Clerk of Section.

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NO. 6. NEW SERIES.

EDITORIALS.

THE OPHTHALMOLOGICAL SECTION OF THE AMERICAN MEDICAL ASSOCIATION.

Since the admirable and extensive program of this section has already been widely published, we have not reproduced it in the columns of the RECORD, but it is hardly necessary to state that no member of our staff is indifferent to the success of the banner section of the Association. We believe that no American ophthalmologist can afford to be absent from the semi-centennial meeting. The RECORD will have a full report of the discussions, with abstracts of the various papers. To accommodate these, an enlarged and special issue of the RECORD will be mailed to subscribers within a week after the close of the session.

HOW MUCH OF OPHTHALMOLOGY OUGHT THE GENERAL PRACTITIONER TO KNOW?

At a meeting of the Clinical Society of the New York Post-Graduate Medical School recently, a very interesting discussion took place in reference to the knowledge of ophthalmology that the general practitioner should possess.

The subject was introduced by the President Dr. D. B. St. John Roosa, in which, the speaker seemed to take the position that a general knowledge of ophthalmology should be part of the education of the general practitioner, in so far that he may be able to diagnose and treat the simple diseases of the eye; and in addition, at least, be able to recognize the more serious affections of this important organ of the human system.

At this discussion the writer, could not agree with the President, from the standpoint, that while his remarks would no doubt apply to the physician practising his profession in the suburban districts, yet, on the other hand, it was my belief, that the less the urban physician knew of the diseases of the eye the better for his people. In other words, in the first mentioned condition it was absolutely necessary; while in the second case, the profession in the large cities, demands and expects that the physician who devotes his study to diseases of the eye should refuse to see or treat any other diseases; and secondly, that there is no necessity for a partial knowledge of the diseases of the eye when a consultant can be obtained so readily. This subject presents many interesting features for the reason that the advance in ophthalmology has been so great during the last two decades that physicians who study ophthalmology find it necessary to almost confine themselves even to a part of their specialty to make their work complete, and in the large cities we find "a specialist in a specialty."

From these many advancements in this domain of practice very few can make themselves fully proficient in the objective methods of examination, etc., so we find some who are eminent in pathology of the eye, others expert in the objective methods and surgery and others who study its diseases in reference to the general system. I may mention, in this connection, Landolt, Knapp, Fuchs and Nettleship, Knies and others who have attained an enviable position in some special branch of ophthalmology.

If these positions are obtained by constant study and application to some special subject requiring the entire time of the physician, then is not the subject too great to expect the general practitioner to be at all proficient in the treatment of diseases of the eye, and where shall we draw the line between what he shall know and what he shall not know?

Under these circumstances, it will be best that we may have such a mutual feeling between the ophthalmologist and the general practitioner that each may work on these lines, one with the other, in an old and honorable profession. If the profession will fully understand and appreciate that the ophthalmologist will confine his work strictly to diseases of the eye and will not treat other diseases, in which the eye symptoms may be only a part, I am sure a time will come when there will be a far better feeling of good fellowship in the profession to the advantage of the physician and his patient.

F. V.

THE ARC LIGHT AND ITS EFFECT UPON VISION.

In 1888 Terrier reported a number of cases of intense inflammation of the conjunctiva, together with great swelling of the lids and profuse lachrymation in those who worked at electric experimentation. This observer speaks of the affection as electric ophthalmia (*l'ophtalmie électrique*) and he made his report to the Surgical Society of Paris in December '87. His observations have been confirmed by Rockliff and Emrys-Jones both of whom report cases of the so-called electric ophthalmia. Maklakoff, of Moscow, in 1889 reported a number of cases where electric light of great intensity had produced not only severe eye symptoms but also an eruption upon the exposed portions of the body, as the hands and face, in workmen in a large factory near Moscow. All these observers were able to demonstrate the fact that the injurious effects were produced by the luminous and the chemical rays and that the heat rays played no part. This latter is an important point, as shewing that it is the peculiar illuminating quality of the electric light to which injurious effects are to be attributed. So much for the effect of the electric light at short range. Some few cases are recorded where the retina has been seriously and permanently injured by exposure to the arc light located further off than in the class of cases just mentioned, but there is nothing in the literature of the subject which bears exactly upon the point under discussion, namely, as to whether the arc light at a railway crossing is a source of danger to those at the crossing.

That the effect of such a light is trying to the eyes, there is no difference of opinion among ophthalmologists. The arc light is not only too intense a light, but too white a light, and is more like lightning. The effect of such a light upon the retina is to exhaust it and to blunt its sensibility, and after the exposure of the eye to such a light and until the retina has recovered from the effects of the powerful stimulus, the person will not get correct impressions (i. e., as to distance and character) of other objects and particularly of less luminous objects, as for instance of the headlight on an approaching locomotive. According to the observations of Fullerton and Cattell, when two lights of equal intensity are viewed in succession the second light appears the fainter. How much more intensified this effect would be when the first light excelled the second in luminosity, or, in other words, when the transition is from the arc light to the headlight. One can understand for oneself what this means by looking at an arc light for a few moments

and then turning away and trying to take in surrounding objects. The latter will appear very indistinct. The period during which the retina is recovering from the effect of the light is known as the period of adaptation, and it is evident that during this period (of variable length) a person would be poorly equipped to avoid an approaching danger which under other circumstances is promptly appreciated. This is what happens to some degree when the arc light shines directly into the eyes of the street traveler, as it would undoubtedly do if placed at a crossing. Bicyclists are constantly complaining of the uncertainty of traveling along roads lit by arc lights, and complaints are not wanting to show that the light on the Statue of Liberty, instead of rendering objects clearer in New York harbor, has rather the opposite effect and so dazzles the eyes of the pilots (in other words, exhausts the sensibility of the retina) that lesser lights, as signals, are seen imperfectly. Some years ago a cluster of powerful arc lamps was suspended at Hell Gate, at the instance of the Sound steamer lines. This light was intended to aid in navigating the crooked and dangerous channel in that vicinity, and it was hoped that it would approximate to daylight conditions by lighting up the whole area of the water. The navigators, however, found that the light was a distinct disadvantage and they pronounced it a failure, and it was abandoned.

It would seem from all this that the electric light under certain conditions produces structural changes in the eyes, these changes showing themselves in inflammation. Under other conditions the effect of the light is manifested chiefly in subjective symptoms known as dazzling and retinal exhaustion, causing the person to see indistinctly less luminous objects, and it is quite reasonable to conclude that these last conditions exist in some degree in the case of the street traveler at the railway crossing lit by the arc light, so that such a light in such a location might prove a source of danger to those at the crossing.

R. L. R.

THE OPTOMETRY BILL.

No measure relating to state medicine, so far presented in this session of the legislature has brought forth anywhere near the opposition that this so-called optometry bill has met with. From the moment of its introduction there has been a constant and vigorous fight against it. And it is safe to say that every medical society and association in the state, every journal which pretends to guard the

welfare of the medical profession and the people, every oculist of good standing and every reputable optician, is strongly opposed to it.

So far the bill has been given two hearings before the assembly committee on General Laws.

The objections to the bill were chiefly as follows: That none but practicing physicians were competent to advise and prescribe for diseased eyes; that there was great danger to the public from irresponsible persons attempting to adjust glasses; that it would license to practice upon an ignorant public a large class of designing and unskilled men who know nothing, and are not required to know anything, about the diseases of the eye, or the underlying pathological conditions of the body which are often the direct cause of derangements of vision.

We are at a loss to understand how the committee or legislature can conscientiously favor such a measure, and should the committee report it favorably, the legislature should promptly vote it down in the interests of humanity.—*Albany Med. Annals*.

SPONTANEOUS HEMORRHAGE IN THE VITREOUS BODY, Or "apoplectic eye," offers an unfavorable prognosis unless effective treatment is instituted at once to prevent the occurrence of the same hemorrhage in the other eye, when the patient becomes totally blind. Professor Panas remarks that it is usually consecutive to syphilis, gout, alcoholism or nasal affections, and therefore the blood should be disinfected, alcohol replaced by milk, the nasal passages rendered antiseptic, and he administers even when there is no syphilis, biniodized oil as a general antiseptic, in 4 milligram injections, supplementing it later with hypodermic injections of arsenic, as he has witnessed a supposed double sarcoma of the orbit vanish completely with the administration of sodium arseniate alone. He concludes his study of the subject in the *Presse Méd.* of April 3, by calling attention to the infective nature of such troubles, which involve the highest questions in general pathology.—*Journal American Medical Association*.



ANGIOID STREAKS IN THE RETINA. DE SCHWEINITZ.

THE OPHTHALMIC RECORD

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NO. 7, NEW SERIES.

ORIGINAL ARTICLES.

ANGIOID STREAKS IN THE RETINA.—SECOND COMMUNICATION.

By G. E. de SCHWEINITZ, M. D.,

Professor of Ophthalmology, Jefferson Medical College.

(WITH COLORED FRONTIS PIECE.)

Last year, at a meeting of the Ophthalmic Section of the College of Physicians of Philadelphia, I briefly detailed the records of a case of angioid streaks in the retina, and afterwards more elaborately presented a paper on this subject before the Thirty-second Annual Meeting of the American Ophthalmological Society, in New London in 1896.

It will be remembered that attention was first called to this affection by Plange¹ five years ago, and that his communication was followed by a number of others, the more important papers having been written by Knapp,² Sydney Stephenson,³ Ward Holden,⁴ Walser,⁵ and Pretori.⁶ To the series of cases I desire to add another at present under my observation. This patient is the brother of the case which I have reported in the Transactions of the American Ophthalmological Society, Vol. VII, p. 650.

Eli Deily, aged 50, born in Pennsylvania, married, laborer, consulted me on the 30th of October, 1896, on account of failing vision. With the exception of unimportant illnesses in childhood, the patient has been a healthy man. He denies venereal disease of any type. He does not smoke, but chews tobacco. He has been

1. Archives of Ophthalmology, 1892, XXI, p. 282. In 1889, R. W. Doyne (Trans. Ophthalm. Soc. U. K. IX, 1889, p. 128) published a chromo-lithograph which closely resembles these pigment striae. The case is described as choroidal and retinal changes the result of blows on the eye. The irregularities in the outline of the streaks were attributed to rupture of the pigment layer of the retina.

2. Ibid, p. 289.

3. Trans. Ophthalm. Soc. U. K., 1892, Vol. XII, p. 140.

4. Archives of Ophthalmology, 1895, XXIV, p. 147.

5. Archiv fuer Augenheilkunde Vol. XXIII; also Archives of Ophthalmology, 1896, Vol. XXV, p. 364.

6. Deutschmann's Beitrage zur Augenheilkunde, 1896, XXIV, p. 101.

a hard drinker, and one year before consultation underwent the so-called Keely cure.

His parents are alive and well. He has six living children; two children died of phthisis, one at twenty-four, and the other at twenty-two; two children died in early life, one of rapid phthisis and another of brain fever. His wife is healthy and has no trouble with her eyes. One brother younger than the patient is said to "see badly;" an older brother has typical angioid streaks in the retina. The patient's vision began to fail about two years ago, the imperfection of sight appearing first in the left eye. It has gradually increased until April 1896. Since this time the vision has been exceedingly imperfect. These visual disturbances were unassociated with ocular pains.

EXAMINATION.—The patient is a medium-sized, somewhat prematurely old man, with pallid countenance and the typical look of defective vision.

The *examination of the urine* is as follows:

Light yellow.
Acid.
Specific gravity 1012.
No Albumin.
No sugar.
No bile.
No sediment.
Microscopical examination negative.

Blood examination:

Haemoglobin } 95 per cent. of normal.
 (13.3 grs. per 100 grs. of blood.
Red corpuscles: 92 Vol. per cent.
 4,620,400 per cm.
White corpuscles: 12,500 per cm.
 1 white to 370 red.

Microscopical examinations shows all corpuscles of excellent shape. Diligent search failed to reveal malarial organisms (there is a history of malaria.)

A differential count of the leucocytes is as follows:

Lymphocytes,	-	-	-	-	4 per 100
Mononuclear lymphocytes,	-	-	-	-	17 per 100
Polynuclear lymphocytes,	-	-	-	-	78 per 100
Eosinophiles,	-	-	-	-	1 per 100
Myelocytes,	-	-	-	-	0 per 100

EYES.—V. of R. E.—counting fingers at 60 cm; of L. E. counting fingers at 50 cm. Each peripheral visual field, form and colors, is normal. The pupils react normally to light and accommodation. The lesions in the backgrounds of the eyes are as follows:

Right Eye.—The optic disc preserves its capillarity upon the nasal side, but presents upon its temporal aspect a patch of atrophic color. It is surrounded by an area of superficial choroidal atrophy. The retinal vessels, both veins and arteries, are about normal in size. Directly in the macular region and occupying a large space of the temporal half of the eyeground is a huge, almost circular hemorrhage, broader and more fringed below, its centre being occupied by whitish and yellowish areas of retino-choroidal atrophy. Chiefly upon the nasal side, and generally following the course of the retinal vessels and lying in plane

beneath them, is a system of branching streaks, somewhat granular in appearance, partly brownish and partly reddish in color. Within the boundaries of the hemorrhage previously noted may be seen another system of streaks, some brownish, and others still fresh and hemorrhagic, and directly connected with and proceeding from the band of blood extravasation which circles this area. Downward and inward from the margin of the hemorrhage may be seen a small patch of similar streaks just beginning to form. The rest of the eyeground is without notable lesion.

Left Eye.—The optic disc is round, the atrophic area being more decided above than elsewhere. It is surrounded by a patch of superficial choroidal atrophy and pigment disturbance. Everywhere throughout the eyeground are numerous anastomosing brownish, and reddish-brown streaks of a character similar to those found in the other eye, but evidently at a more advanced period of their formation. The macular region and temporal half of the eyeground are occupied by a large vertically oval plaque, of choroidal atrophy streaked with black pigment. Boardering this, below it and between it and the disc are broad reddish bands, somewhat resembling exposed choroidal vessels. Indeed, in some instances they are representations of the vascular supply of this layer of the ocular coats. (See Figure.) It is evident that the process in the left eye, which was the one first affected, represents a further stage of metamorphosis than the right eye, in which the hemorrhagic nature of the affection and the direct connection of these streaks with the hemorrhages is more manifest.

Remarks.—If at the present time there was any doubt of the hemorrhagic origin of these dark brown, anastomosing bands, the present case, as well as the brother of this patient, already reported to the American Ophthalmological Society, would remove it. As I have already stated when describing the first case, the hemorrhagic nature of the lesions is evident. They may be traced from their origin in hemorrhagic metamorphosis, during the stage in which the formed striae, still partly hemorrhagic in nature, are disposed in characteristic and branching lines, to their later development into true pigment streaks and ridges. In all the other cases thus far reported, with the exception of two, hemorrhages have been present in the retina.

So far as the explanation of these cases is concerned, Plange believes they represent a deposition of pigment in striae in the retina after hemorrhage, followed by changes, probably hyperplastic, in the supporting fibres of Müller. Knapp practically agrees with this explanation, stating that the extravasated blood has been converted into these dark, vessel-like streaks. Stephenson reports his case without comment. Ward Holden concludes that "it would seem warrantable to assume as a hypothesis, to be verified by future observation, that the affection retinitis striata, like that called angiod streaks, arises through the elements of peripheric hemorr-

hages, being diffused in a linear manner in the deep layers of the retina, and undergoing various sorts of metamorphoses." Walser in endeavoring to explain this affection, excludes retinitis pigmentosa, retinitis striata and striae in the retina after detachment, and suggests that a retinitis in the outer layers may be the cause of these pigment stripes. In order to account for the arrangement of the stripes he is willing to suppose that the proliferation of pigment, or the original inflammation in the retina, has followed the lymph spaces described by Schwalbe and His,—an etiology already suggested by Ward Holden, who deems it probable that the diffusion may take place, in part at least, through previously existing lymph channels. Both of these authors, however, admit that this hypothesis does not rest upon very secure foundation inasmuch as our knowledge of the lymph channels in the retina is very indefinite. Walser has further suggested as a second possibility that these changes may take their original start from retinal hemorrhages occurring in infants. Pretori, whose case comes between the publication of my first case and the present instance, concludes that it is probable that the lesions may be explained by assuming a congenital anomaly of the retina—an explanation, in the face of the facts previously reported, which is quite untenable.

The extent of the fundus lesions in the various cases reported has differed considerably. In some, for example, Walser's, there was no choroidal disturbance; in others, as, for example, in Stephenson's, Knapp's and my own cases, there was marked choroidal disease.

The present instance is another clinical example of this remarkable metamorphosis of retinal hemorrhages, for there is no manner of doubt of the hemorrhagic origin of the affection. Evidently it can occur under circumstances and with various lesions in the general fundus, one condition only, being necessary for the production of the streaks, namely, a hemorrhage or a series of hemorrhages which are gradually converted into these branching striae. An interesting point, already referred to is that two brothers are affected, with a possibility that a third may have some similar lesion, although it has not been possible as yet to examine his eyes.



THE CURVATURE OF THE CORNEA IN REFERENCE TO
THE REFRACTIVE CONDITION OF THE DIOPTRIC
APPARATUS IN THE TWO PRINCIPAL
MERIDIANS. *

BY FRANCIS VALK, M. D.,

Professor of Diseases of the Eye at the New York Post-Graduate School and Hospital, &c., &c.

(CONCLUDED FROM JUNE ISSUE.)

I now come to the most interesting part of these examinations, the relation of the radius of curvature to the refraction of the dioptric apparatus in the two principal meridians; and for which I have taken such a large number that these examinations may be somewhat conclusive as shown in the table.

The first question that may be asked is: What is the normal radius of curvature? or in other words, What radius of curvature do we find generally associated with the normal or emmetropic refraction of the eye? Now we find the radius of curvature in the emmetropic planes, in a large number of the cases, varies between 7.5 mm. and 8 mm.; within these two radii we have 258 measurements, or about one-fourth of the total number, and if we take the mean of this, we have a radius of curvature of about 7.65 mm. as representing the normal radius; if so, then all radii above that mean will probably be hypermetropic and that all radii below that number will probably be myopic.

At this point I wish to explain what I mean by the emmetropic plane. I would illustrate it in this way, for instance in a case of simple myopic astigmatism, the measurements would show in the vertical meridian a myopia and in the horizontal meridian would be recorded emmetropia.

Bearing these two points in mind, if we take the total figures as shown by the table, we have these results:—

Radius, 7.65 mm. and greater, = 620, of which 213 Em., 350 Hy., and only 57 My. A proportion of only *one in ten*.

Radius, 7.60 mm. and less, = 486, of which 158 Em., 218 Hy., and 110 My. A proportion of *one in three*.

We are justified then in assuming, that the normal radius of curvature is about 7.65 mm., and in making our examination with the

* Read before the Ophthalmic Section of the New York Academy of Medicine, March 15 1897.

ophthalmometer, that if we also take the radius of curvature in the two principal meridians we will have a "clew" or indication of the existing state of refraction. If we find that the radius of curvature is greater than 7.65 mm., then we have an average of myopia of only one in ten; consequently the probability is that the case is *hypermetropic*. On the other hand, if we find the radius of curvature is less than 7.65 mm., then the case is probably *myopic*, as now the proportion of myopia is much larger, namely one in three.

These examinations have been so interesting to me that I long since gave up the method of using the ophthalmometer by the overlapping of the mires and now read off the amount of the astigmatism by the methods mentioned before in this paper.

Of this large number of examinations, 89 corneæ, giving measurements in 178 meridians, showed no astigmatism in any meridians; in other words, the radius of curvature was the same in the two principal meridians. This radius varied in length, but was generally near the normal radius of 7.65 mm.; while the examination by the other objective methods the refraction was found to be hyperopic, myopic or astigmatism "against the rule," and in a few cases emmetropic.

In the consideration of this subject I am led to express some views, I believe to be true, in reference to the curvature of the posterior surface of the cornea.

I am well aware that we have the supposition, that in case the ophthalmometer does not show any overlapping of the mires, that we have no astigmatism, or if so it is "against the rule," that this astigmatism is due to an unequal curvature of the lens, or an oblique position of the lens in its fossa, that will neutralize or overcome the astigmatism of the anterior surface of the cornea; but has this been proved by scientific examinations? or does it not simply depend on the fact, according to Burnett, page 45, that the first person who demonstrated astigmatism, Thomas Young, found or supposed his astigmatism existed in the lens, for the reason that "he immersed his eye in a chamber of water, bounded by a plane glass surface," and the difference in the refraction did not disappear? True, that test would eliminate the anterior surface of the cornea, but could not his astigmatism have existed on the posterior surface, in spite of the alleged fact, that the refractive index of the aqueous is the same as that of the cornea?

Further, Burnett states on page 43 that "a number of eyes with normal vision have been measured as to the curvature of the various corneal meridians and in almost all there was found a meridian of least

curvature (longer radius) and at right angles to this another of greatest curvature (shortest radius). In other words, the human cornea does not represent, by its surface, the section of a sphere with equal radii, but approaches in form more nearly to an ellipsoid with three unequal axes." Yet, in this series of cases I present 89 corneæ that appear to be a perfect "section of a sphere with equal radii," as far as the anterior surface of the cornea is concerned, out of a total of over 500 corneæ examined, giving nearly one-sixth that presented no astigmatism of the anterior surface.

In further support of the view, that astigmatism "against the rule" may be due to the curvature of the posterior surface of the cornea, I find in Norris and Oliver, *System of Diseases of the Eye*, page 218, in an article by G. A. Piersol, M. D., this observation: "The human cornea varies in thickness from .08 mm. at the centre to 1.1 mm. at the periphery when viewed in vertical section." This change in the thickness of the cornea must produce very material changes in the radius of curvature of the two surfaces, and may this difference not be great enough for the curvature of the posterior surface to neutralize or completely change the refraction of the dioptric apparatus in any one meridian?

As far as I know we have no positive knowledge of the astigmatism of the lens, as I am not aware that the curvature of the anterior surface of the lens has ever been measured in any of these cases of marked astigmatism "against the rule," and unfortunately we have no instrument yet devised in which the curvature of the lens can be as readily measured as the anterior surface of the cornea; hence, the statement that the astigmatism "is in the lens" is only a supposition proved only by the fact, that the index of refraction of the aqueous seems to be the same as that of the cornea.

I can readily understand how the pressure of the lids may cause corneal astigmatism in foetal life, but I cannot see any possible cause for an astigmatism of the lens, as it must be surrounded by a perfectly equable pressure from the time—"the lens sac—which becomes detached from the external epiblast" (Holden, page 5) until it reaches the period of the perfectly formed eye.

To complete this discussion of the radius of curvature I will now refer to some of our text books, that we may compare their conclusions with my own, namely, that the normal radius of curvature is about 7.65 mm.

Donders, page 37, writing about the anterior surface of the cornea,

says, that the radius of curvature averages about 8 mm., and considers the two surfaces parallel, in the region of the apex of the cornea; while according to my table I find only about 50 meridians that measure 8 mm. or over, that show emmetropic refraction. Also we find that Donders states on page 89: "The final result, therefore, remains what we laid down in starting; that myopia usually depends upon an elongation, and hypermetropia upon a shortening, of the axis of vision," and yet, I find a striking relation, that seems to exist, between the radius of curvature of the cornea and the refractive condition of the dioptric media in corresponding meridians. Also in Donders' tables on the same page, he gives the average radius of curvature in about 235 cases, in which his average is constantly higher than my own, and finds very little difference in the radius of curvature between the myopic and hypermetropic cases; yet, do not these measurements of my table seem to show a constant relation between the radius of curvature and the refraction?

Donders' table quoted above gives:

In men—Maximum, 8.396 mm.; minimum, 7.28 mm.; average, 7.858.

In women—Maximum, 8.487 mm.; minimum, 7.115 mm.; average, 7.799.

From this you will note that my maximum measurements are much larger, namely, as high as 8.65 mm, and that my minimum measurements are much smaller, as 6.5 mm., giving me the average of only 7.65 mm., and associated with which we find that the refraction is generally emmetropic.

Landolt gives about the same average radius of curvature as Donders, and considers that nearly all cases of ametropia are due to the length of the optic axis. From this he divides his cases of ametropia into two classes: namely, Refractive, when they are dependent on the refractive conditions of the dioptric apparatus; and Axial, when they are dependent upon the lengthening or shortening of the optic axis. While this may be true, it is impossible to ascertain the antero-posterior diameters of these cases, yet I must note again, the similarity of the curvature of the cornea and the refractive condition, as shown by my table of measurements.

Before closing this paper I wish to state, what seems to be an interesting fact, shown by the method of keeping the record of measurements by the ophthalmometer, that in some of my cases, when I have been able to examine the radius of curvature at different

periods, after the first measurements were taken, by the same instrument and under the same conditions, that in these cases I found the radius of curvature has very materially changed.

This would show that the theory formerly held, that the radius of curvature of the cornea was always the same, is not positively so in all cases.

I will illustrate this by a report of the following cases recently examined a second time :

Case I Mrs. W., age 38 First examined in February, 1894.

Radius—R. E., vertical meridian, 7.45 mm. L. E., 7.25 mm.

Radius—R. E., horizontal meridian, 7.65 mm. L. E., 7.65 mm.

Retinoscopy gives R. E. 1.50 D., L. E. 2.50 D. hypermetropia with hypermetropic astigmatism. Vision with glasses = $\frac{20}{15}$.

Seventeen months later, or June, 1895 :

Radius—R. E., vertical meridian, 7.75 mm. L. E., 7.55 mm.

Radius—R. E., horizontal meridian, 7.9 mm. L. E., 7.85 mm.

Retinoscopy now gives R. E. 0.75 D., L. E., 1.75 D. hyperopia.

Vision with same glasses = $\frac{20}{15}$.

This case shows a decided increase in the radius of curvature with a much less amount of hypermetropia. The vision remaining the same.

Case II. Dr. T. F. W., whose radius was measured two years ago At that time his refraction was hyperopic, had no astigmatism ; radius of curvature of cornea, 8.15 mm. At the present time I find his refraction the same, but now his radius of curvature has increased to 8.45 mm I find no change in his visual power, from this evident flattening of the corneal surface

Case III. Mrs. E. P. J., age 30. Examined Dec, 1895.

Radius—R. E., vertical meridian, 7.65 mm. L. E., 7.65 mm.

Radius—R. E., horizontal meridian, 7.90 mm. L. E., 8.10 mm

R. E., hyperopic astigmatism, 0.50 D. ax. 100°

L. E., hyperopic astigmatism 2.25 D. ax. 80° .

Fourteen months after. in Feb, 1897 :

Radius—R. E., vertical meridian 7.90 mm. L. E. 7.80 mm.

Radius—R. E., horizontal meridian, 8.15 mm. L. E., 8.35 mm.

Refractive condition the same as at first examination.

Case IV Mr. J. F., age 30. Examined Sept, 1896.

Radius—R. E., vertical meridian, 8.15 mm L. E., 8.25 mm.

Radius—R. E., horizontal meridian, 8.35 mm. L. E. 8.15 mm.

Seven months after in March 1897 :

Radius—R. E., vertical meridian, 8.45 mm. L. E., 8.55 mm

Radius—R. E., horizontal meridian, 8.55 mm. L. E., 8.40 mm

Retinoscopy showed no astigmatism in R. E., and hypermetropic astigmatism of 1 D. axis 180° in L. E.

These four cases, all show an increase in the length of the radius

of curvature or a flattening of the anterior corneal surface, equal to, at least, a diopter in the refractive condition.

Two more interesting cases are presented in this series, in which the radius of curvature is just the opposite to that of the refractive condition, as in the case of a lady, whose refractive condition and vision under atropin was as follows: $\frac{2}{30}$, w —15 D. sp. \bigcirc —1 D. cyl. ax. $180^\circ = \frac{2}{30}+$. Yet, I find the radius of curvature is 7.75 mm. in the vertical meridian, and 8.50 mm. in the horizontal meridian, showing that the myopia was due to the extreme length of the optic axis. In another case, in which the vision = $\frac{2}{10}$, w +0.75 D. sp. \bigcirc +0.50 D. cyl. ax. $180^\circ = \frac{2}{10}+$. In this case the radius of curvature was only 6.50 mm. in the horizontal meridian, and 6.70 mm. in the vertical meridian.

These two cases show a remarkable difference in the relation between the curvature of the cornea and the refraction and must be due to the length of the optic axis.

To sum up the conclusions, based on these examinations, that seemed to be proved by my table, I would suggest them, as follows:

That the ophthalmometer of Javal will give us other useful information, in reference to the refraction of the eye, than that of simply the amount of astigmatism, as shown by the over-lapping of the mires.

That the radius of curvature bears a certain definite relation to the refractive condition of the eyes, in which, if we find that the radius of curvature is greater than 7.65 mm., that the refraction is probably hypermetropic, as we find only one in ten myopic; on the other hand, if the radius of curvature is less than 7.60 mm., that the refraction is myopic, as now the proportion is found to be one in three.

That in cases of astigmatism "against the rule" it may be due to the curvature of the posterior surface of the cornea and not always to exist in the lens.

That the radius of curvature of the cornea is not always the same throughout life, but that it tends to become greater, showing a gradual flattening of the corneal surface.

And lastly, that this method as described, of examination and recording, will make the ophthalmometer a much more useful instrument in the determination of the refractive condition of the human eye.

ORBITAL PERIOSTITIS—REPORT OF CASE.*

By WM. C. BANE, M. D.,

Late Ophthalmologist to the Chair of Neurology, and Chief Clinical Assistant in Ophthalmology and Otology in the Medical Department of the University of Colorado; Ophthalmologist and Otologist to the House of the Good Shepherd; Oculist and Aurist to the C. R. I. & P. Ry.,

Denver, Colo.

ILLUSTRATED.

On Sept. 1st, 1896, I was called by Dr. E. Eckerson to see an infant five weeks old. The babe appeared healthy, and well nourished.



Fig. 1.—Orbital Periostitis in child five weeks old. Dotted line indicates where incision was made.

Parents in good health; no history of any taint. When three weeks old, a swelling of the right upper eye-lid was noticed by the mother. The swelling increased from day to day, and presented at the end of a fortnight an interesting picture. (Fig. 1).

* Read before the Denver and Arapahoe Co. Medical Society, March 9th, 1894.

The lid was intensely swollen, of a dark and purplish hue, and firm to the touch. The conjunctiva and cartilage of the upper lid projected downward over the lower lid about 8 mm., was markedly chemotic, and of a dusky color. A view of the eye-ball was not obtainable. At the most prominent point of the swelling of the lid there seemed to be some softening of the deeper tissues. I made a free and rather deep incision at this point, through which about an ounce of thick pus was evacuated.

The following day the swelling was very much reduced and upon probing, denuded bone was encountered in the upper, outer wall of the orbit, extending fully three-quarters of an inch back of the ridge. The wound was cleansed daily with a 1-2000 solution of formalin, and loosely packed with bichloride gauze.

After eight days the swelling had disappeared, and the eye was found to be normal. A piece of denuded bone could be outlined with the probe, but was as yet attached.

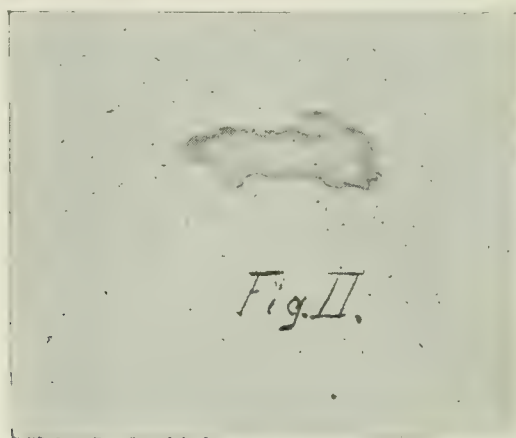


Fig. 2.—Actual size and shape of plate of bone removed thirteenth day after incision was made.

The case was then turned over to Dr. Eckerson, the family physician. Five days later, a small plate of bone was removed, after which the wound was allowed to close. Only a linear scar, three-fourths of an inch long, remained at point of incision. No contraction of tissues has taken place, and it is not likely that any will occur, as six months have elapsed since the wound was closed.

Disease of the orbit is rather rare, occurring on an average of once in every 800 cases out of 250,000 eye patients.† Inflammation of the orbit appears as cellulitis, or periostitis. Berry states that "children are especially liable to periostitis of the orbit." The disease is usually found in the lower, outer margin, but in this case it was quite deep, and involved the upper wall.

† Berry on Dis. of the Eye. 2nd ed., page 404.

MALIGNANT GROWTHS OF THE ORBIT, WITH REPORT OF A CASE.

By J. W. BULLARD, M. D.

Of Pawnee City, Nebr.

Dr. C. S. Bull, who has made a careful study of tumors of the orbit, has formulated the following conclusions, concerning malignant tumors in this region.*

1. The prognosis of all forms of malignant orbital tumors, whether primary or secondary, is unfavorable, and if the tumor is primarily in one of the deep facial bones or their sinuses, the diagnosis is positively bad.

2. Except in the case of encapsulated tumors of the orbit, surgical interference is almost invariably followed by a return of the tumor, and the growth of the secondary tumor is more rapid than that of the primary lesion. With each succeeding operation, the period of quiescence in the return of the tumor grows shorter, and the rapidity of the growth increases.

3. The patient's family, and in certain cases the patient himself, should, in the beginning, be told the serious nature of the trouble, and be warned that complete removal of all the diseased germs is a well-nigh hopeless task. The burden of the decision as to surgical interference must rest upon the shoulders of the patient.

4. Repeated operations in these cases undoubtedly shortens the life of the patient. While it is, therefore, our duty to operate in all cases in order to relieve severe and unbearable pain, we should be slow to operate merely for the sake of relieving, temporarily, physical disfigurement or deformity, especially if we are convinced that by so doing we shorten the life of the patient, even if that shortened life is rendered more bearable to him."

In the discussion of Dr. Bull's paper Dr. H. Knapp endorsed the diagnosis except as it related to tumors of the lachrymal gland and optic nerve. He said tumors of the former were not primarily very malignant and may not return for many years.

Long periods may elapse in some forms before a return of the disease, but it has been my experience, and so far as I have been able to ascertain, the experience of all who have to do with these growths, that, unless thoroughly encapsulated, and removed early, they almost without exception, return sooner or later.

*New York Medical Journal, Aug. 29, '96.

Bearing on this subject, I wish to report the following case, which I think of more than ordinary interest:

J. F., age 36, married and of good family and personal history, the very picture of health, and weighing about 180 lbs., consulted me on Aug. 10, 1890, for diplopia, which he first noticed during the previous winter. There were slight exophthalmus of the left ball, which was crowded downward and inward, some ptosis, and external rotation was restricted. V. O. D. = $\frac{20}{20}$. V. O. S. = $\frac{20}{50}$, improved with a +0.75 D. sp. to $\frac{20}{30}$. Fundi normal. Palpation revealed a firm tumor well under the orbital arch, which appeared to involve the lachrymal gland. The patient was put on increasing doses of pot. iodide, following which there was an appreciable improvement in both subjective and objective symptoms.

After a month or so patient was lost sight of till the first of July, 1891, when he presented himself again. The tumor had materially increased in size, and was then projecting beyond the border of the orbit, and the ball was considerably displaced. The growth could be mapped out from the supraorbital notch around to one cm. below the external canthus.

The patient was apprised of the pros and cons of operation, and chose to have the growth removed, which was accordingly done on the 9th of July, under chloroform. The tumor was exposed by a curved incision just beneath the margin of the orbit, extending from the supraorbital notch to the external canthus. It proved to be an encapsulated and lobulated tumor of the lachrymal gland. It was very easily separated from the sheaths of the ocular muscles and the anterior part of the roof of the orbit; it extended, however, to the apex, and was quite firmly adherent above, where it was necessary to use the enucleation scissors. The incision was closed and a compress bandage applied. The wound soon healed, the ball returned to its normal position and full acuity of vision was restored. A microscopic examination showed it to be an adeno-sarcoma of the lachrymal gland.

In the spring of 1892 the disease recurred, and the patient was informed that it would be necessary to sacrifice the ball that the orbit might be eviscerated, as that promised the only, though somewhat forlorn, hope of relief. Drs. H. Gifford and D. C. Bryant, of Omaha, each saw the case with me at this time and concurred in this opinion. Accordingly on the 17th of May '92, the patient was again anesthetized with chloroform, the eye enucleated, the growth removed, and the contents of the orbit thoroughly eviscerated, except the periosteum from the floor which did not seem to be involved in the least. The orbital plate of the frontal bone, which was affected, was thoroughly scraped with a Volkmann sharp curette.

Early in September there were signs of a relapse, and by November the growth had filled the orbit and begun to crowd out the lids. The patient wished me to make one more effort, which I did on the 16th day of November. Every vestige of periosteum was removed from the orbit even going into the sphenoidal and sphenomaxillary fissures. The superior border of the orbit was chiseled away and the roof scraped as thin as possible without exposing the brain.

The next spring, '93, there was a return of the tumor, which gradually enlarged until at the time of his death it covered the entire left side of his face and grew down through the antrum and filled the roof of his mouth.

I did not see him after the summer of '93, but a recent letter from his widow informed me of the later condition. The tumor broke down

at one point and discharged pus for a few days about ten months before his death, and then healed and remained a solid tumor until the end, which occurred on the 2nd day of August, 1895, over five years from the time he first consulted me.

Whether this man's life was prolonged or shortened by the operations, I am not prepared to say, but he lived five and one-half years after the growth began to interfere with the proper movements of the eyeball.

These cases progress very rapidly sometimes, as did case No. 2 of Dr. J. A. White's series.*

In May, 1895, Dr. Casey A. Wood, of Chicago, eviscerated the orbit for sarcoma in a boy 13 years of age. In July of the same year he came into my hands, and the growth having returned was protruding from the roof of the orbit and crowding out the upper lid. The boy died on the 13th day of August following from pernicious anemia, whether as a result of the sarcoma or not I am not able to say.

In this case (I quote Dr. Wood) "the tumor was an ordinary example of compact, non-pigmented sarcoma with flattened cellular elements.

TWO CASES OF MARKED AND RAPID CHANGE IN REFRACTION IN PATIENTS SUFFERING FROM GLYCOSURIA ASSOCIATED WITH VARIATION IN THE AMOUNT OF SUGAR SECRETED IN THE URINE.†

By S. D. RISLEY, M. D.,

Of Philadelphia, Pa..

Attending Surgeon Wills' Eye Hospital, Philadelphia; Professor of Diseases of the Eye, Philadelphia Polyclinic and College for Graduates in Medicine.

The following cases of saccharine diabetes exhibiting remarkable changes in the refraction of the eyes, associated with variation in the amount of sugar excreted with the urine, seem to the writer of sufficient interest to place upon record in the annals of the society:

Mrs. S., aged 49, was sent to me by her physician, Dr. Ward, in November, 1882. She was the subject of glycosuria, but her physician reported that under treatment by the nitrate of uranium the sugar, which had been very abundant, the specific gravity of the urine rising at times to 1050, had entirely disappeared. She no longer suffered from thirst and the general health had greatly improved. She complained, however, that with the improvement in her general condition her

* *Journal A. M. Association*, vol. 19, No. 16, page 460.

† Read before Am. Oph. Society at Washington, D. C., May 5th, 1897.

vision had grown rapidly worse, so that she was not able to read or see distant objects clearly with her glasses, +2.75 D., although she had experienced no difficulty in this respect until within a few days. With her glasses, V., O. D. = $\frac{1}{8}$, O. S. = $\frac{1}{4}$, and there was no range of accommodation. The optic nerves were very red, and the margins veiled, but no hemorrhages or splotches were present in the eye ground. The lenses were slightly opalescent and the nucleus was plainly outlined in both, but there were no spicules of opacity or stria. The tension was normal, and the cornea transparent. A mydriatic was instilled, and after careful examination she received for O. D. +5 D. \subset +1.25 cy. ax. 75° , V. = $\frac{6}{vi}$. O. S. +6 D. \subset +.75 cy. ax. 105° , V. = $\frac{6}{vi}$.

Ten days later the glycosuria had returned and she complained once more of dim vision with her glasses, which were then reduced to +3 and 3 50 D. respectively, with cylinders as before, which gave her $\frac{6}{vi}$ in each eye. Accommodation was still absent. On the 31st of October, fifteen days later, the refraction had once more increased until she chose for O. D. +1.25 D. \subset +1.25 cy. ax. 75° , V. = $\frac{6}{vi}$. O. S. +1.50 D. \subset +.75 cy. ax. 105° , V. = $\frac{6}{vi}$. The anterior chambers were shallow, the lenses strongly reflecting but no opacity present. She remained under observation for several months with no further notable change in the ocular conditions, but her general health failed rapidly under the persistent glycosuria and the attending nutritional changes.

Case II. Mr. W. C. S., aged 74. Has been suffering for at least six years from saccharine diabetes, under the professional care of Dr. James C. Wilson, of Philadelphia. During that time the sp. gr. of the urine has rarely fallen below 1020 and rarely risen above 1030. His treatment had been carefully conducted, and strictly carried out by an intelligent and loyal patient.

The condition of his eyes in August, 1896, was as follows: The refraction error was corrected by O. D. +1.50 \subset +1.25 cy. ax. 180° , V. = $\frac{6}{vi}\frac{1}{2}$. O. D. +1.25 \subset +1.25 cy. ax. 180° , V. = $\frac{6}{x}$.

The anterior chamber was shallow in each eye, and through the narrow pupil the eye ground could be seen with difficulty, and all details were veiled. The pupils dilated small medium only with homatropin, but sufficient to reveal spicules of opacity in the lower half of both lenses, more advanced in the left eye. The nucleus was here plainly outlined, and with oblique light the lens seemed opalescent with plainly differentiated sectors. The eye ground was very fluffy in appearance, with gray white splotches here and there through the fundus, and a large semi-atrophic crescent or conus embracing the lower temporal border of the optic nerves. These conditions were present in both eyes, but more advanced in O.S., and remained with but little variation until April 9th, 1897, the vision being on that date recorded as O. D. $\frac{6}{vii}\frac{1}{2}$. O. S. $\frac{6}{x}$. On April 23rd he complained of dim vision for distant objects and inability to read even large type with his reading glasses. V. = $\frac{6}{x}$ in each eye with his distant glasses. He expressed his surprise over his failing vision in view of the fact that he was much better in all other respects. Dr. Wilson reported the sp. gr. of the urine as having fallen from an average of 1026 to 1012, on one occasion being as low as 1006, and no sugar, or but a trace present.

He now selected O. D. +2.50 \subset +1.25 cy. ax. 180° , V. = $\frac{6}{vii}\frac{1}{2}$. O. S. +2 \subset +1.25 cy. ax. 180° , V. = $\frac{6}{ix}$. There was no notable change in the fundus or lens of either eye.

On May 20th, 1897, Mr. S returned saying he had been compelled to return to his old glasses within a few days, as the new ones blurred his distant vision, and that the reading glasses compelled him to hold his book too close to the face. He now selected his old glass with each eye, with which O. D. V $\frac{6}{vii}$ $\frac{1}{4}$, O. S. V. $\frac{6}{xx}$. There was a slightly diminished acuity of vision in each and in O. S. the lens was swollen and distinctly more opalescent. The specific gravity of the urine was 1027 and it contained 4.20 per cent. of sugar.

The probable cause for the rapid change in the refraction of the dioptric system of the eye in these two cases furnishes a most interesting inquiry, any answer to which, however, must be purely hypothetical. It is highly probable that the unstable equilibrium of the transparent component cells of the crystalline lens would be readily disturbed by qualitative change in its environing fluids, especially any change from the normal relative density or specific gravity of the tissue of the lens and the nutritive fluids in which it is bathed. It is well known, for example, that the entrance into the tissues of the frog of rapidly diffusible substances, as chloride of sodium, naphthalin and sugar impair the transparency of the lens, presumably because of some such changes as suggested above in the osmotic qualities of the fluids in and around the lens. These considerations render it at least probable that in the cases here recorded the change in the density of the tissue fluids suggested by the varying amounts of sugar secreted with the urine, was sufficient to disturb the physiological relation of osmosis in the lens and by this means to cause the observed changes in the refraction of the eye.

VICARIOUS HEMORRHAGES INTO THE EYES AT THE MENSTUAL PERIODS.—REPORT OF A CASE.

By A. EDWARD DAVIS, A. M., M. D.,

Assitant Surgeon Manhattan Eye and Ear Hospital; Instructor in Diseases of the Eye, New York Post-Graduate Medical School; Attending Ophthalmic Surgeon Bellevue Hospital, O. D. P.

Lena B—, a young married woman, aged 22 years, came to the clinic of Drs. Lewis and Van Fleet, at the Manhattan Eye and Ear Hospital on January 12th, 1897, and was assigned to me for examination and treatment.

History.—One year ago the right eye became suddenly inflamed and the sight very much impaired. This inflammation was mild in character, lasted but about one week and got well of itself without any treatment. The sight in the eye returned to some extent, and now by the aid of glasses is very good.

One week ago she awoke with the sight gone from the left eye, just as it had gone from the right eye, though it was perfect on going to bed the night before. She noticed the change in the eye more particularly, because the sight was so poor in the right eye, and because she depended on the left eye almost altogether for her work.

No specific or rheumatic history could be elicited after a searching inquiry, and the condition of the patient certainly shows no trace of either. Although the patient is 22 years of age she never menstruated until she was 21 years old, the flow lasting but about 24 hours, being very scanty and often not necessitating the use of a napkin. She has never had any painful menstruation and has always been regular. For the last 12 months the patient has complained of sleepiness at times, but she has never been seriously ill and has never been injured.

The patient's father died at the age of 35, when she was a small child, and she does not know of what disease; her mother is living, aged 51 years, and in good health. She has 5 sisters, one older and the others younger than herself all healthy and with good sight.

The sudden loss of sight in the right eye, afterwards partially restored (vision now in that eye is $\frac{20}{200}$, brought up to $\frac{30}{80}$ ths with a proper glass) occurred just two days before the establishment of the menstrual periods; and the sudden impairment of sight in the left eye took place about one year later, just one day after the menstrual flow.

Condition.—Her general health is first-class. She weighs now 135 pounds, although when 16 years old she weighed 160 pounds. Her flesh is firm, not flabby, and she has not lost but rather gained in strength since she has not been so stout. She eats well, has no cough, and on examination of her chest by Dr. Bowles shows her to have sound lungs and no heart lesion of any kind.

Dr. William H. Haskin made a vaginal examination and reports a retroversion, but the womb is perfectly movable, the os uteri patulous and offering no obstruction to the menstrual flow. Dr. Haskin also examined the blood of the patient and found it rich in haemoglobin — 90 per cent. — and in red corpuscles; so there is no pernicious aenemia in the case.

The urine has been examined repeatedly, especially for sugar, but none has been detected. The specific gravity, 1008, is rather low, but no trace of albumen been found at any time. The quantity of urine passed in 24 hours is normal, about 50 ounces; and there is no diminution of urates which might cause an increase of blood tension; nor is there any indication of oxularia.

There is no history of epistaxis, but the patient suffers from constipation.

Eye Conditions.—Right Eye,—the ophthalmometer shows a large amount of corneal astigmatism. Vision $\frac{20}{200}$; $\frac{20}{30}$ with a — 0.50 D. sp. C — 3.50 D. cylinder, axis 60°. The pupil is irregular, partly occluded at the periphery, and there are posterior synechiae. Under the use of atropine—solution 4 grains to the ounce—instilled every five minutes for 40 minutes, the synechiae yielded above, but a firm adhesion remained between the lens and the iris below. The ophthalmoscope showed the fundus of the right eye to be normal.

Left Eye,—the ophthalmometer showed but 0.50 D. astigmatism. Vision $\frac{20}{40}$, not improved. The pupil is about $\frac{2}{3}$ dilated, but reacts slightly when light is thrown into either eye, more markedly, however, when the light is thrown into

the right eye—consensual reaction. The tension is normal; no pain. In fact she has never had pain in either eye, but has complained of a heavy feeling in the forehead at times.

The ophthalmoscope shows a hazy fundus, but with a red reflex all over it. This diffuse haziness is so marked that the disc and retinal vessels cannot be made out. However, with a plus 2 D. glass in the ophthalmoscope, a triangular white spot, about $\frac{1}{3}$ the size of the disc, can be seen just at the outer side and below the disc, about 4 millimeters from it. In the center of this triangular white spot is a small red spot, and extending from this red spot, directly forward, and slightly upward, is a baloon or cone-shaped membrane, the apex of the cone attached to the red spot and the membrane extending forward into the vitreous. This cone-shaped membrane could be traced distinctly by gradually increasing the strength of the plus glasses in the ophthalmoscope, till the base of the cone could be best seen with a plus 8 diopter glass. The diffuse haziness of the fundus indicated that the coloring matter of the blood from the hemorrhage had become dissolved into the vitreous.

Treatment and Progress of the Case.—A cathartic was prescribed to begin with, and, not knowing what else to do, the patient was placed on the mixed treatment of mercury and potassium iodide, though no specific history could be obtained.

At the end of one week the pupil had contracted down to almost its normal size and the vision had improved from $\frac{1}{200}$ ths to $\frac{8}{200}$ ths. The haziness of the fundus changed but little however.

On Feb. 8th, about one month after first observing her, the pupil had resumed its normal size and action, the haziness of the fundus cleared considerably, but not sufficient for a view of the disc or blood vessels. Vision had increased $\frac{18}{200}$ ths. On this date I presented her to the New York Ophthalmological Society. In the discussion which followed, it was suggested that *retinitis proliferans* might follow the hemorrhage, as this rare condition sometimes follows hemorrhage into the vitreous.

March 3rd about two months since the hemorrhage, the vision has improved to $\frac{20}{200}$ ths; the fundus is sufficiently clear to get a faint outline of the disc and the large retinal vessels, and to show that the hemorrhage is from the choroidal vessels. The membrane is thinner than at first, but still persists. No blood vessels can be traced on to it.

Etiology, Prognosis and Treatment. Etiology.—In reporting this case of vicarious, or as some would prefer to call it idiopathic, hemorrhage into the eyes of this young woman, I am not unmindful that hemorrhages of a like character also occur in the eyes of the opposite sex, especially at puberty and up to 25 years of age. However, these idiopathic hemorrhages into the vitreous are very rare. Niden observed it only nine times in 35,000 cases between the ages of 15 and 24 years. The etiology of recurrent, spontaneous hemorrhages into the eyes of young adults—excluding, of course highly myopic and diseased eyes—remain obscure. The very term *idiopathic* hemorr-

hage which is applied to this condition by most writers, is a confession of uncertainty of cause.

Nieden*, in a paper on this subject read at Heidelberg in 1882, says its cause cannot be traced, and especially excludes albuminuria, diabetes, syphilis, gout, haemophilia, &c, as factors in its etiology.

Eales† considers the condition due to a neurosis. He says—"From the character of the hemorrhage, and from the evidence of local variations of circulation, and from the slow pulse, constipation, flushing of the face, headache, and puffiness and discoloration of the eyes, I am inclined to attribute this combination of conditions to a neurosis affecting both the circulatory organs and the digestive system, leading on the one hand to partial inhibition of the muscular movements of the bowels, and to vasomotor contraction of the vessels of the alimentary canal, with inhibition of its secretory functions, thereby causing dyspepsia, constipation and malnutrition; and on the other hand to a compensatory dilatation of the systemic capillaries, especially those of the head, and in these cases of the retina causing over distension of the venous system and systemic capillaries, with liability to rupture on the occurrence of any identifying cause."

Zieminski‡ is of the opinion that hypertrophy of the heart may have something to do with it, but he thinks the real cause is due to auto-infection from retention of decomposed faeces. Or, if we put his words into the language of to-day, we would say *ptomaine* poisoning.

The fact that most of the cases that have been reported have been obstinately constipated would seem to lend some color to his theory.

Spalding, in an exhaustive and ably written article on this subject, in 1892, gives three factors as exciting causes, viz. (1) to violent exercise, (2) suppression of habitual discharges—menses, epistaxis, bleeding hemorrhoids, etc.—(3) over-work of the eyes.

That menstruation, particularly abnormal menstruation affects the eyes at times cannot be doubted, judging from the number of well observed cases reported in literature.

The cases of recurrent herpetic eruption on the cornea, regularly at the menstrual period, reported by Landesburg§ and Ransohoff^a are classical. And Mueller,^b in 1893, reports the case of a woman who

* Reviewed in *Archives Ophthal.*, Vol. II, page 432.

† Quoted in Berry's Text-Book, *Diseases of the Eye*, page 319.

‡ *Record d'ophthal.*, 1888

Arch Ophthal, Vol. 21, pages 220-30.

§ Hirschberg's *Centralt.*, 1883.

^a Zehender's *Monatbl.*, 1889.

^b

1893

had menstruated regularly from her 15th year, and who from her 24th year had a recurrent conjunctivitis with marked chemosis at each menstrual period, until she married and became pregnant. During three pregnancies the conjunctivitis ceased, to recur between times. This case was so well marked and closely connected with the menstrual periods that Mueller called it *Chemosis Menstrualis*.

Friedenwald,* in a recent paper on—Affections of the Eye and Normal Menstruation—reports two cases of superficial punctate keratitis, one case of conjunctivitis, one case of iritis, and two cases of hemorrhages into the vitreous, which recurred regularly at the menstrual periods for a number of months. The cases of iritis and vitreous hemorrhages, however, occurred in previously diseased eyes. His opinion was—"that menstruation acted only as an exciting cause through the increased pressure of the general vascular system."

In the case reported by me, I am of the opinion that the hemorrhage into each eye was due to the general increased blood-pressure in all of the vessels, from the almost complete suppression of the menses, and perhaps partly from constipation.

Treatment.—Graefe was of the opinion that these cases did just as well without any treatment whatever as under the best of treatment.

Nieden advised mercurials and iodide of potassium. Spalding strongly advised the hypodermic injections of muriate of pilocarpine, 1½th gr. once a day, Heuteloup's leech to the temple, and constant current.

I may say that I consider the natural leech just as good as the artificial one of Heuteloup. The alimentary canal in these cases should be carefully looked after and a general hygienic *regime* carried out.

Prognosis.—On the whole prognosis is good. Unless the hemorrhage recur too often the vision remains fairly good—sufficient for practical purposes.

* *Journal of Eye, Ear and Throat Diseases*—(Baltimore)—October 1896.



A CASE OF UNRECOGNIZED EMPYEMA OF THE RIGHT
SPHENOIDAL SINUS; GREAT EXOPHTHALMUS AND
DIVERGENCE OF RIGHT EYEBALL; EXTEN-
SIVE EDEMA OF RIGHT SIDE OF FACE
AND NECK. DEATH. AUTOPSY.

By D. W. GREENE. M. D.,

Of Dayton, Ohio.

Oculist and Aurist to National Military Home, to Deaconess Hospital (Protestant), to St. Elizabeth Hospital (Catholic).

ILLUSTRATED.

The subject of diseases of the accessory cavities of the nose is attracting a good deal of attention at this time. The October, 1896, number of the *Archives of Ophthalmology* contained a very interesting and instructive paper by C. R. Holmes, of Cincinnati, in which the anatomy of this region is thoroughly gone over, and several apparent errors in relation to the topography of the region as given by Gray and others are pointed out. He also gives histories and symptoms of two very interesting cases of sphenoidal disease, one he diagnosed during life and operated upon through the nose, as proposed by Zuckerkandl, the patient recovering and vision which had been lost, partially returning. The character of the other case was not recognized during life.

Dr. Henry Gradle's paper and its discussion before the Chicago Academy of Medicine, printed in the *Journal of the American Medical Association*, December 19th and 26th of last year, have given new interest to the study of disease in these cavities. As long ago as 1863 Horner of Berlin reported a case of a girl 15 years old who became blind, had exophthalmus and immobility of the right eye, with slight swelling of the head of the optic nerve, and who died a few months later of meningitis. A post mortem examination revealed a condition so nearly analogous to the case I shall report, that it need not be given here. Particular attention might be called to the statistics given in Dr. Gradle's paper bearing on the frequency of sinus disease, as reported by Fraenkel, Wolff and Harke.

Fraenkel reported about one year ago that he had made 146 autopsies on unselected cadavers in the dead house at Hamburg. In no single case had a diagnosis of disease of the sinuses been made during life, yet he found disease in one or more of the sinuses 63 times, or in about 40 per cent.

Wolff has reported the autopsies of 22 children who had died of diphtheria in every instance of which, the maxillary sinus was diseased. In 15 the sphenoidal sinuses were not developed; in the other 7, in which these sinuses were developed, they were invariably found diseased.

Harke made 30 autopsies on as many children dead of acute infectious diseases and found one or more of the sinuses affected in every case, and of 37 adults examined post mortem, dead of acute infectious diseases, he found sinus involvement 31 times.

The frequency with which the different cavities are involved seems to be about as follows: First the maxillary, second the frontal, third the ethmoid and fourth the sphenoid. As to the order of frequency of disease of the first two there can be no question, but there may be some doubt as to the relative frequency with which the last two cavities are affected. That diseased conditions of the accessory cavities are very common and not very dangerous to life, the statistics just quoted abundantly prove. Still a sufficient number of cases (probably 25 in all) have been recorded in which death was clearly due to extension of inflammation from the ethmoidal cells or sphenoid sinuses to the meninges, to the brain itself or to the large venous channels at its base, causing thrombosis and septicaemia.

The following case is recorded in the hope that it may be helpful in further elucidating the obscure signs and symptoms of this disease:

Henry Sensenbaugh, age about 29 years, farmer living near Gordon, Ohio, had obstruction of nasal cavity whenever he took cold; took stock to market on Thursday, December 3rd, 1896. Complained of pain in his head, which was worse when he reached home in the evening; had complained of headache for several weeks; located pain deep in the head back of the eyes. Went to bed Friday Dec. 4th, complaining of increased headache and terrible aching throughout his body. He was seen the next day, Saturday, Dec. 5th, at 10 a. m., by Dr. W. H. Kiester, who has kindly furnished me the following history:

"My first visit to Sensenbaugh was at 10 a. m. Saturday, Dec. 5th. His symptoms were slight cough, small amount of expectoration (character not stated), temperature $101\frac{1}{2}$, pulse 90, respiration 24 complained of great frontal headache and pain behind his eyes and he was constantly blowing his nose. My second visit was at 5 p. m. Sunday, Dec. 6th. His wife said he had passed a very bad night and had been restless all day. Pain was so severe that he had to have morphine every three or four hours. His right eye began to pain him severely Saturday night; this continued all day Sunday and at the time of my visit the eyeball was bulging out, was divergent and he said he could not see anything with it. Temperature $104\frac{3}{4}$, pulse 88, respiration 26. Noticed some fullness of the right side of the face and neck; he was perfectly conscious, sat up in bed, had good use of speech and of his extremities and said

pain was not so great now since he had taken so many resting powders (morphine). My third visit was on Monday, Dec. 7th, 9 a. m. Found general condition of patient anything but encouraging. Temperature $99\frac{1}{2}$ pulse 82, respiration 28, some discharge from the right nostril tinged with blood. The eye was still prominent at this time. I learned that it had been painful all the night before, especially so from 2 to 4 a. m., when he became unconscious and remained so until death at 1:15 p. m. Vomiting was a frequent symptom after taking food "

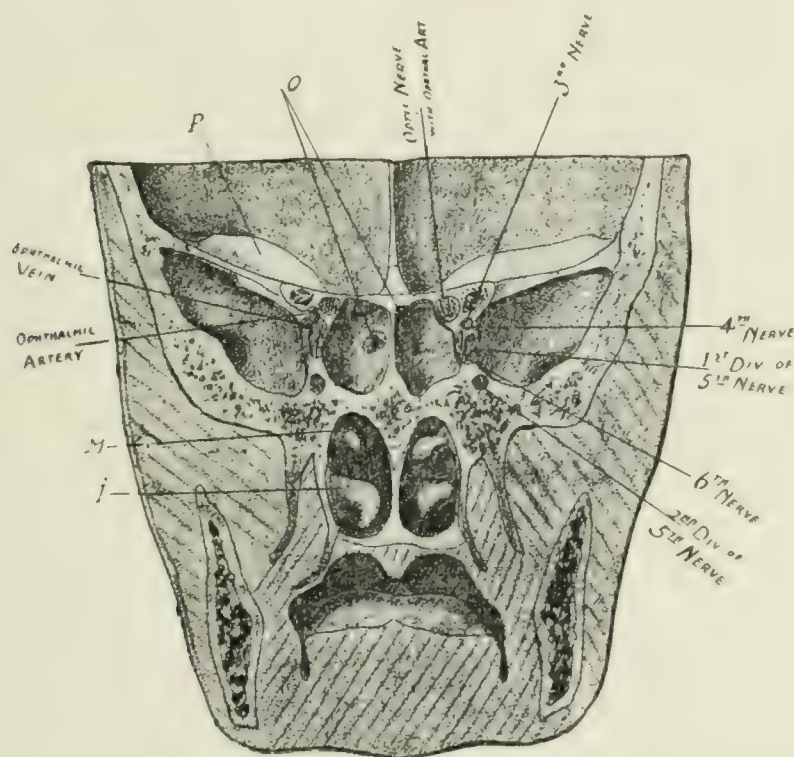
I was called to see this case on account of his eye symptoms, but it being too late for the early train I did not reach his residence until 1:30 p. m. He had been dead about fifteen minutes when I arrived. The appearance of the face and neck was unnatural and striking, and the exophthalmus of right eyeball was the greatest I have ever seen, the divergence being also marked. On account of the dry and wrinkled condition of the cornea an ophthalmoscopic examination was not possible. The left eye however was still clear. In this eye there was no papillitis, no retinal hemorrhages; the veins were large and tortuous and the arteries empty like mere threads.

The train of symptoms of which I learned, the rapid dissolution and the unnatural appearance of the eye, side of face and neck, all pointed to an obstruction of the venous circulation at the base of the brain, the extent, location and cause of which nothing but an autopsy could reveal. We readily obtained consent to have one made, and Dr. Ellis of Dayton, formerly first assistant surgeon and pathologist at National Military Home, was telegraphed. I append his findings:

AUTOPSY UPON BODY OF HENRY S.

On the night of Dec. 7th, 1896, at the request of Dr. D. W. Greene of Dayton, Dr. W. H. Kiester of Arcanum and others, I made an autopsy upon the body of one Henry S., a farmer near Gordon, Ohio. The body was that of a male, about 29 years of age, 5 feet 9 inches in height, well developed and nourished. P. M. rigidity pronounced. P. M. staining slight. Body was warm; autopsy seven hours after death. Contents of chest and abdomen not examined. No external evidence of recent or past disease or injury except about the head. The head and face presented a peculiar and striking appearance. There was marked oedematous swelling of the tissues of the right cheek running up over the right side of the forehead backward to the ear and downward over the neck almost to the clavicle. A muco-sanguinolent discharge oozed from the right nostril, and the right eye, boggy and bloodshot, bulged from its socket forward between the swollen lids at least half an inch. Its axis was divergent and it

could be reduced only slightly by pressure. There was no sign of fractured bone, emphysema or inflammation here. On the left side of the face there was slight oedema of the eye-lids, but no congestion of conjunctiva or exophthalmus. The pupils of the two eyes were equal in size, moderately dilated and regular. No discharge from either ear and none from mouth, except frothy stomach contents. On removing the calvarium a large amount of clear serum escaped, decidedly in excess of the usual quantity. The brain itself was apparently normal, except for slight excess of cerebro-spinal fluid in the ventricles and general oedema. The meninges were markedly oedematous. On



Frozen section of anterior half of head, cut immediately in front of chiasm. *P.* Orbital roof of frontal sinus. *O.* Ostium sphenoidale. *Y, Y'* Right and left sphenoidal cavities. *I, M.* Inferior and middle turbinates.

removing the brain a very interesting picture was disclosed. The blood vessels, veins in particular, occupying the floor of the right anterior and middle cerebral fossae were engorged with blood; the overlying dura was boggy and opaque and the anterior clinoid processes, together with the superior wall, or roof, of the right sphenoidal antrum were of a greyish red color, almost black in places, and necrotic. The right ophthalmic vein and artery, the right optic nerve and other minor

structures occupying this position about the right clinoid process, were agglutinated and embedded in a mass of inflammatory lymph. On chiseling through the orbital plate of the frontal bone the cellular tissue, muscles, nerves, etc., lying in the orbit behind the globe were infiltrated with lymph and swollen.

Cause of death : Abscess of sphenoid cavity.

Immediate cause of death : Oedema of brain,

S. BLACKBURN ELLIS,

Dayton, Ohio.

Reference to the accompanying plate, which Dr. C. R. Holmes has kindly permitted me to use, will aid in explaining the symptoms in this case. His interpretation of the symptoms in one of his own cases, which was almost identical with my own, I quote :

“First : Dull pain inside of head at intervals for a year or more, aggravated by cold.

“Due to inflammation in sphenoidal cavity, with retention of pus when ostium sphenoidale was closed by the swelling of the mucous membrane and swollen turbinated bodies.

“Second : Neuralgia of first division of fifth nerve, gradually becoming intense and constant.

“Cause : Extension of inflammation through thin bony walls of sphenoidal cavity into the sphenoidal fissure, causing first irritation, then pressure, on the fifth nerve.

“Third : Visual disturbance slowly increasing to total blindness.

“Cause : Inflammation extending from sphenoidal cavity through bone of “paper thickness” to optic nerve. Reduction of calibre of ophthalmic artery for same reason.

“Fourth : Exophthalmus and congestion. Caused by inflammation in sphenoidal fissure and strangulation of ophthalmic vein.”

In addition to these I would explain the oedema of the eyelids and face in my case upon the same principles that Dr. Holmes suggests in the case of exophthalmus and congestion, that is, obstruction to the return of blood through the ophthalmic vein, combined however with a general inflammatory process in the orbit as found at the autopsy.

SOME CAUSATIVE FACTORS IN ULCERATIONS OF THE CORNEA.

By FRANK H EDSALL, M. D.,

Ophthalmic Surgeon to St. Francis Hospital and to the Pittsburg Hospital for Children.

In the treatment of corneal ulcerations there has been, in the experience of the writer, in certain of these affections, much to be desired from the standpoint of rapid results, and it was in the belief that there were causative factors not generally recognized and to the neglect of which were to be attributed, in a large measure, the unsatisfactory results from treatment that he has been led to submit this brief consideration of two points in the etiology of the affection which are, seemingly, often unrecognized or disregarded.

Every ophthalmologist has brought to him, not rarely, young children with eyes swathed in bandages and otherwise guarded, whose dread of light is so acute that the mere attempt to remove the coverings is productive of a struggle which, once they are removed, becomes so desperate, in the effort to protect the eyes from the light, that a satisfactory examination without anesthesia is almost impossible. When once the lids have been separated and the eyes examined carefully it will be seen that the inflammatory symptoms are, usually, not especially pronounced in degree. There is, usually, some injection of the subconjunctival vessels and profuse lachrymation and, somewhere on the cornea, there will be found a spot of ulceration, generally, I think, very small in extent and rather superficial in character. As a rule, there is little tendency for this ulcer to increase in size, but there is, likewise, very little tendency towards healing. I have, in times past, exhausted, as I thought, all possible solutions of the etiological riddle in these cases without finding anything that offered a foundation upon which to base treatment which subsequent trial has proven satisfactory. These cases are most frequently found among rather poorly nourished children or among children who have been given too much latitude in their eating and are, as a consequence, affected with digestive disturbances, but it has been my experience that the strictest attention to diet, to hygiene, to the state of the digestion or to the use of alteratives or tonics, combined with the most approved course of treatment local to the eyes, will not suffice to bring about a cure of the trouble within a reasonable space of time.

My attention having been drawn to the fact that almost or quite all of these cases have an irritating discharge from the nostrils which

produces an eczematous condition of the skin about the nose, I was led to believe it possible that the condition of the nasal mucous membrane might be the causative factor in the case and, acting upon this thought, I determined to direct my attention in such cases, chiefly, to the treatment of the intra-nasal trouble. The results from this treatment have been most satisfactory. Cases of this character which had, heretofore, resisted such means of treatment as I had at command have promptly yielded to the relief of the nasal trouble, combined, of course, with the usual methods used in the treatment of the eye affection and in several instances, where I had been successful, for the time, in relieving the ocular trouble but had been bothered by repetitions of the attack I have been able to do away with the tendency towards a relapse. I do not know that this idea is at all new, but I may say that I have never, that I can recall, seen more than the most casual mention made of it in any work on ophthalmology and the subject of the relationship between inflammatory conditions of the nasal mucous membrane and this form of ocular trouble is, apparently, quite generally ignored, although it is, I am convinced, a more satisfactory explanation of the occurrence of many ulcerations of the cornea than the attention which is given to it would indicate.

Just what treatment should be adopted for the nasal trouble I need scarcely consider here. For my own use I prefer an alkaline spray with Listerine, or some similar preparation, followed by the application of nitrate of silver in such strength as may seem appropriate. I believe that the ocular trouble is undoubtedly of bacterial origin with the infection propagated from the nasal cavity, and my chief aim is to keep the nasal cavities as sterile as may be and to reduce the inflammatory state of the mucous membrane as rapidly as possible.

To illustrate the difference in results between cases treated without attention to the condition of the nasal mucous membrane and those in which attention was given in this structure I shall briefly mention two cases in which both methods were used.

The first was that of the six year old daughter of a promising glass manufacturer of this city. A too liberal indulgence in sweets and other indigestible food had impaired her nutrition, but this impairment was not sufficient to altogether explain the eye affection, a corneal ulcer quite typical of the variety I have mentioned. At intervals, for over a year she was under treatment with, in general, such unsatisfactory results that I was becoming thoroughly disgusted with the case. Everything that I had ever used for this condition and everything that seemed of value to use was tried with unsatisfactory results. In despair almost, I determined to subject her to a thorough course of treatment for the rhinitis with

which she was affected, hoping to get some improvement from this. The results were surprising. In less than a month the ulcer had entirely cicatrized and up to the present time, over three years, there has been no return of the trouble. The only variation from the previous treatment used in the case was in the direction of relief to the nasal mucous membrane.

In this case I had, myself, for a long time overlooked the possible relationship between the ocular affection and the intra-nasal trouble. In the case which follows a much older practitioner than I erred in the same way and it was, I am convinced, due to the lesson I had learned from the other case that I was able to relieve this case so promptly.

The case was that of the three year old adopted daughter of a newspaper man of this city. She was a very self-willed spoiled child for whom it was almost impossible to do anything because of her struggles and the dread of her foster parents lest she should be hurt. Previous to coming into my care she had been, for six weeks, in the hands of one of the oldest specialists in diseases of the eye in the city with, as the parents said, no improvement in her condition. Examination of the eyes demonstrated the presence of a minute ulcer of the cornea at the nasal margin of the pupil of the right eye; pronounced injection of the subconjunctival vessels was also noticed and, in addition, there was profuse lachrymation and intense dread of light. The skin about the nose was excoriated by the discharge from the nostrils which, the parents informed me, had been present from the inception of the eye trouble. The little patient had had the benefit of the usual line of treatment for such cases without relief to the eye, and as there had been no treatment directed toward the nasal trouble, I considered it advisable to give chief attention to this condition, although I did not, of course, neglect the necessary local treatment for the eye. Coincident with the improvement in the rhinitis there was a lessening in the eye trouble. The injection diminished the ulcer began to fill up and the photophobia disappeared with a rapidity that was remarkable. In less than two weeks instead of the child who had shrieked in terror at the mere suggestion of exposing her eyes to light she walked into my office with no protection to her eyes other than a moderately tinted pair of glasses, and even these she would remove without hesitation.

I can see no reason to doubt that the good results in both these cases were due, chiefly, to the relief of the nasal affection. Both of them were cases that had baffled all treatment till attention was given to the rhinitis when they promptly recovered, and in neither of them has there been subsequent trouble.

I might materially lengthen the list of cases thus treated without adding emphasis to the lesson taught by these two. I will therefore turn from this phase of my subject, merely remarking in passing that I make it a routine practice now when I find any nasal trouble present in a case of corneal ulcer which I have to treat to always give as much attention to that as to the condition present in the eye.

Another point often overlooked in determining the causation of

corneal ulcer, yet not to the same extent as the one just mentioned, I think, is the relationship between this condition and errors of refraction. The refractive defect most prone, I think, to cause disturbance in the nutrition of the cornea is a myopic astigmatism, although I have seen the cornea involved in an inflammatory affection arising from excessive demand upon the ciliary muscle dependent upon almost any of the various refractive errors. The mechanism of its production is, doubtless, identical with that of inflammations in other portions of the eye due to the same cause—interference with the trophic influence of the nervous system upon the nutrition in consequence of over-stimulation of the nerve supply to that part and to circulation disturbance. There is no special characteristic of this form of corneal trouble to distinguish it from other corneal ulcerations, beyond its tendency to recur, that I have been able to observe. All forms of corneal ulcers, however, demand close inquiry into the refractive state of the affected eye, and if this point be attended to this causative factor will not be overlooked.

I might cite numerous cases illustrative of the bearing which a refraction error may have upon a corneal ulcer, but the one which follows is so typical that it will suffice.

Mr. F., an official in a large manufacturing concern, consulted me for an ulceration of the cornea for the right eye. The ulcer was crescentic in form at the nasal margin of the cornea. The usual symptoms of the affection were present, and the only noteworthy point in the course of the disease was the little tendency it exhibited to yield to anything less active in the way of treatment than the galvano-cautery. Within a period of some six months the patient had three attacks of this form of ulceration, twice in the right eye and once in the left. I had suggested the advisability of obtaining glasses early in my experience with him, but he had demurred, partly because he did not care to wear glasses and partly because, after the loss of time caused by the ulcerations, he did not wish to remain away from business long enough to use a mydriatic. Following the third attack, however, I insisted upon this procedure and he finally consented. I found a myopic astigmatism of 0.75 D. slightly off the horizontal meridian in both eyes and prescribed glasses accordingly. There has been since then no further tendency toward the previous trouble, and the patient wears the glasses with a very great deal of comfort.

It may seem to some of the readers of this journal that I am threshing old straw in the subject I have presented, but if such be the case I beg to plead in extenuation that I have so frequently seen both points overlooked in the treatment of ulcers of the cornea, and as the etiology of this condition has considerable bearing upon its therapeutics I felt that they were deserving of more consideration than is usually accorded to them.

TWO CASES OF GLAUCOMA, FOLLOWING CATARACT EXTRACTION.

By S. MITCHELL, M. D.,
of Hornellsville, N. Y.

Oculist and Aurist to St. James Mercy Hospital, Oculist to the Erie Railroad.

Glaucoma, following cataract extraction, fortunately is one of the more rare occurrences, attending this operation, yet the ophthalmic surgeon, who preforms extraction without iridectomy, may expect the pathway he pursues to surgical fame, will at sometime be made rough and thorny by one of those soul discouraging incidents, that occasionally follow and bring to naught an operation that was apparently crowned with success. Nor is the career of the surgeon who always performs extraction by the combined operation, one of perfect serenity, "calm and unruffled as a summer's sea," unmarked from start to finish by this calamitous sequela. I saw a case at Moorfield's Hospital in London, less than two years ago; where a successful extraction, performed with an iridectomy, and unattended with any incarceration of iris in the wound, was followed by glaucoma.

I was first prompted to write of my experience with glaucoma following cataract extraction, by receiving a visit from one of the gentlemen, whose case is spoken of farther on. My exhilaration of mind at the successful outcome of his case was of course natural and I at once resolved to publish it. The happy termination of a condition so serious and decidedly *unhappy*, struck me as being something worth telling to those interested in ophthalmology. Some days latter, as my thoughts along this line began to make their appearance upon paper, another case, similar in many respects to the one spoken of, but dissimilar in result came to my mind.

If some of the incidents in the course of one case were encouraging and soul cheering, I think all will agree that nearly all the incidents, that form the closing scenes in the history of the other case, were sufficiently depressing to prevent any undue elation on the part of the operator. Hence, it occurred to me that if both cases were published at the same time, it might prevent too much of the victory-snatched-from-the-jaws-of-defeat tone from prevading the whole article. So instead of performing the pleasant task of writing about a successful case only, I resolved to give the history of an unsuccessful, but none of the less instructive one, as well.

Case I. Mr. L., a gentleman 84 years of age and a widower. His occupation as an undertaker, had been sufficiently remunerative, to allow him at this age

to retire from business with a comfortable bank account, that permitted him to live at his leisure in a near by city. Although in his dotage and nearly blind from cataracts, the blindness seemed to be his only impediment to a thorough enjoyment of the many follies and pleasures that are supposed to be the prerogative of the giddy youth, rather than the octogenarian.

His vision was as follows: O. D. Fingers at ten feet; O. S. Fingers at two feet; Projection of light good in the left eye, and vision was normal.

The cataract was removed from the left eye by the simple operation, under cocaine anaesthesia. The operation was perfectly smooth and recovery uneventful. Sixteen days after the operation, the dense semi-opaque capsule was divided with a Knapp's knife needle. The eye at this time was nearly free from redness and there was no increased tension.

The reaction following the discission was insignificant. Thirteen days later vision was $\frac{2}{80}$ W. + 4 D. sp. \bigcirc + 8 D. cyl. axis 165° , and J. 4. W. 11 D. sp., \bigcirc + 8 D. cyl. axis 165° . Measured by the Javal ophthalmometer that was 13 D. of astigmatism, but the use of any stronger cylinder than 8 D. was not attended with any further improvement in vision. The eye was now free from redness and tension was not increased. The glasses were prescribed and a few days later he returned to his home. Just previous to his departure, his vision had improved to $\frac{2}{80}$. So this eye was numbered among the successes; only for the brief period of two months however, as succeeding events proved.

One morning two months later, my heart was saddened by the sudden appearance of this patient at my office. He informed me that he had experienced a very sudden and severe attack of pain in the eye operated upon, a few days previous, accompanied with headache and bilious vomiting. The sight of the eye, he said, declined rapidly. The pain and general wretchedness continued unabated, and indeed his whole appearance told more eloquently than his words, the story of his sufferings.

There was some enlargement of the blood vessels in the sclera, and T. + 2. The cornea was clear and the pupil dilated ad maximum. Vision was reduced to l. p.

A general haziness of the vitreous prevented an examination of the fundus. The anterior chamber was *deeper* than normal. This, together with the fact that the free border of the iris seemed to be curled backward, led me to believe that this part of the iris had become adhered to the edges of the button-hole in the capsule; thus impeding the flow of the intraocular fluid and high tension was the result.

No amelioration could be expected by the use of myotics, so long as the condition detailed above existed. So I decided to preform an iridectomy at once.

Under chloroform anaesthesia, assisted by Dr. W. E. Hathaway of this city, the usual opening for iridectomy in glaucoma, was made into the anterior chamber; but the iris having shrunk to such a narrow band, with the pupillary border curved backward, it was impossible to grasp it with forceps. A firm hold on the membrane was secured, however, by the means of an iris hook, and the first effort at traction resulted in breaking, to quite an extent the adhesion that bound the iris. A copious gush of vitreous accompanied the breaking of the adhesions, and each effort to draw the iris out of the wound, only resulted in allowing more

vitreous to escape, until the globe became so flaccid that I desisted from further operative measures.

There was very little pain following the operation and the eye healed very kindly, recovery taking place rapidly and satisfactorily. The entire cessation of pain and the reduction of the high tension to normal, followed as the result of the operation.

Eserine was used for some time after the operation and there was a slight improvement in vision, but not sufficient to be of any service.

He was last seen two years ago; one year from the date of the last operation. At this time there was absolutely no change in his condition. There had been no return of pain, and tension was normal. The optic disc was very pale and slightly cupped, and the retinal vessels were small and threadlike.

Case II. Mr. S, a farmer 63 years of age, mature Cataracts in both eyes, vision amounted to l. p. only. Projection of light good. Tension normal. No enlargement of blood vessels of the sclera in either eye. He was first seen Sept. 6th, 1895, and on the 24th of the same month, the cataract was removed from the right eye. The operation was performed under cocaine anaesthesia, without iridectomy. The operation was smooth and satisfactory and recovery was uneventful. The eye was opened on the third day, and by the tenth day he was walking about the house and yard unattended, although a dense capsule, prevented anything like good vision. His condition had been vastly improved by the operation, and he was quite jubilant.

He returned to his home and remained for two weeks. At the end of this time, Oct. 25th, he presented himself for the second operation. A sickle-shaped knife-needle was employed and a transverse incision made in the capsule. The dissection was followed by no reaction to speak of. Vision was greatly improved and three days later he visited my office. The ophthalmometer showed the astigmatism to be 6 D. axis 15° . Vision was $\frac{2}{30}$ W. + 6.50 D. sp. \odot + 6.50 D. cyl. axis 20° and J. 4" W. + 11 D. sp. \odot + 6.50 D. cyl axis 20° .

These glasses were procured for him, within ten days from the time of the last operation, and he returned to his home. Scarcely two weeks had elapsed, when one morning I received word from his physician, informing me that he had been called to see Mr. S. the day before, and found him suffering from very severe pain in the eye operated upon, attended with vomiting.

Of course I suspected at once that his trouble was an attack of glaucoma, and immediately notified his physician to have him come to me without delay. Notwithstanding my importunity, several days elapsed before he came. There was an interval of at least five days, between the onset of the disease and the performing of the iridectomy.

He reached my office at noon accompanied by his daughter. One glance at his eye confirmed all my suspicions as to the nature of his trouble.

The eye presented all the peculiar appearances, that mark a typical case of acute glaucoma. The ocular conjunctiva inflamed and somewhat chemotic, the cornea steamy, and the anterior chamber obliterated. The pupil was dilated to about double the usual size. T. + 2 and vision barely amounted to l. p. Eserine solution was instilled into the eye several times during the time that he was in my office, which was about one hour. There was no perceptible diminution of tension following its use. An appointment was made for the operation of iridectomy at

2 o'clock the same afternoon. At this hour, assisted by Dr. Charles Phillips of this city, I did a very free iridectomy upward on the eye, while the patient was under complete anaesthesia, secured by A. C. E. mixture.

Although some vitreous escaped during the operation, I was not only able to remove a good generous piece of iris, but I passed an iris hook into the pupillary space and enlarged the opening in the capsule. The eye healed very nicely and immediately began to improve in every particular. The eserine drops were continued during the process of healing. Pain and tension were greatly relieved by the operation, and vision also began to improve, so that when he returned to his home, two weeks after the operation, his vision was $\frac{18}{10}$ W. + 9.50 D. sp. and J-5 could be read rather imperfectly W. + 18 D. sp. I heard from him occasionally during the summer, and learned that his vision had steadily improved, and that he was able to do some work about his farm. Using the glasses that were first prescribed.

He came to see me on the 6th of last November. Just one year from time the operation for iridectomy was performed. The eye appeared perfectly well and tension was normal. There was a nice clear black pupil. And is it any wonder that my heart swelled with pride, as I looked upon the symmetrical coloboma, the making of which, a year before, seemed but a forlorn hope.

Vision was $\frac{20}{40}$ W. + 9 D. + sp. \odot + 4 D. cyl. axis 30° and J-4 could be read fluently, W. + 11 D. sp. \odot + 4 D. cyl. axis 30° .

In closing I will add that I am inclined to ascribe the failure in Case 1, to the irreparable injury done the nerve and retina, early in the disease; rather than to the fact that a piece of iris was not removed.

The relief to pain and tension, secured at once, demonstrated beyond a doubt that the cause of the plus tension had been reached and removed by the operation as performed.

DIPHTHERITIC CYCLOPLEGIA CURED BY A SECOND ATTACK OF DIPHTHERIA.

By F. PARK LEWIS, M. D.,

Of Buffalo, N. Y.

Very little has been written concerning the value of antitoxin in other than acute diphtheritic processes. In some forms of membranous conjunctivitis its value has been manifest, but instances are so unusual in which an acute development of the diphtheritic poison has on passing away taken with it the results of a previous infection as to make the following case worthy of record:

Miss S., a trained nurse, was taken ill with what her physician considered to be a very light form of follicular tonsillitis, in the early part of March, 1896. She was isolated as a matter of precaution and confined in bed for one week. Her illness was so slight, however, that it was not deemed necessary to have a bacterio-

logical examination made of the few white patches that appeared on the tonsils. The breath was not offensive, there was no great loss of strength, indeed almost all of the characteristic indications of true diphtheria were wanting. At the end of a week she had fully recovered her normal physical tone which was never very high, her strength having been gradually exhausted by protracted overwork. She then began to complain of difficulty in seeing, and having been referred to me by her attendant, Dr. G. R. Stearns, I found both pupils dilated *ad maximum*, with complete paralysis of the accommodation. A careful refractive test was then made, and her vision was found to be R. +5.50 D. sph., V. = 0.7, L. +5.50 D. sph., V. = 0.7. The ophthalmometer showed in each eye half a diopter with the rule. The muscles were all weakened, abduction 1° , adduction 9° , R. sursumduction 1° , L. sursumduction 1° . The cycloplegia prevented, of course, muscular tests at a proximal range. Ophthalmoscopic examination was negative. Various methods of treatment were resorted to for a number of weeks, including strychnia, faradization and, finally, an injection of antitoxin was made without in any way modifying the condition of the accommodation, the antitoxin disturbing her stomach and causing general discomfort. As she was far from strong, she took a long vacation, resting during the summer, and did not come to see me again until October, when the condition of the pupil was found unchanged, with no improvement in the strength of the ciliary muscle. She had, however, a small chalazion forming on the left lower lid on the inner margin near the canthus. An interesting fact was developed in this connection. A most careful test for astigmatism had previously been made; the ophthalmometer now showed for the left eye an overlapping of 1.25 D. at an angle of 75° . With +0.50 D. cyl. at an angle of 75° , V. = 1. In the right eye the ophthalmometer showed 0.50 D. at 100° . With +0.25 D. cyl. axis 100° , V. = 1.

A phenomenon previously observed and worthy of careful study showed in this connection is that with the formation of chalazia we have sometimes, at least, changes in corneal curvature, and it is worthy of careful study to determine whether this is due to the pressure of the tumor upon the eyeball, or to some disturbance of innervation, which at once affects the lid and a corresponding meridian in the cornea.

Another interesting fact in this connection is that a small amount of astigmatism which had not previously existed, was found to have arisen in the corresponding meridian of the fellow eye; but that is another story. Along in the fall the function of the ciliary muscle in the left eye began gradually to be restored, and the pupil had reached perhaps half its normal size, the right remaining still widely dilated, when on January 17th, nearly a year after her first attack, she was taken seriously ill with unquestionable diphtheria. The temperature rapidly reached $106\frac{1}{2}$, and ultimately $106\frac{3}{4}$. Her chart showed that the treatment of her physician, Dr. Moseley, consisted of protonuclein, the throat being swabbed with peroxide of hydrogen, with an injection of antitoxin. The disease was quickly controlled, and the chart was discontinued at the end of a week, and very shortly after the patient discharged. It was found that as convalescence progressed the accommodation was gradually restored, and by the time that she was fully recovered the pupil had become normal in size, and the functional activity of the ciliary muscle was fully regained.

A CONTRIBUTION TO QUININE BLINDNESS.

By A. W. CALHOUN, M. D., LL. D.,

Of Atlanta, Ga.

A ten year old girl was brought to me from one of the river bottoms of Arkansas with the following history :

The family lived in a low flat section of country immediately upon the banks of a river, where malarial fevers prevailed at certain seasons of each year. In this neighborhood several persons had died of congestive chills. The population was composed entirely of farmers who had been taught by their physicians to rely upon the free use of quinine in the treatment of all malarial affections, especially congestive conditions. Every house kept several ounces of quinine on hand, and the prevailing practice was to give large and repeated doses when the first evidence of a congestive chill was manifested.

This child had a chill which the father diagnosed as congestive, and a large dose of quinine was promptly administered. No precautions were taken to weigh or measure the doses, but they were simply poured from the ounce bottle. The fever and an occasional rigor continuing, frequent and large doses of the quinine were given until, at the end of the third day, the child had taken one and a half ounces or 720 grains, the entire quantity on hand. The lack of more quinine and the unconscious condition of his daughter alarmed the father sufficiently to induce him to call in his family physician, who lived twenty miles distant. The doctor at once recognized the true state of things, and after several days of vigorous treatment brought the patient back to consciousness, but she was totally blind. Her general health improved so slowly that not until the end of six weeks was she able to travel and be brought for treatment of her eyes.

The ophthalmoscope revealed a typical white atrophy of both optic nerves, with not the faintest perception of light, and the blood vessels of the fundus were diminished to mere threads. The pupils were widely dilated and responded to light very imperfectly. The hearing had been much affected also, but had greatly improved, so that ordinary conversation could be heard at five or six feet. I gave a most unfavorable prognosis, but kept the patient under treatment three or four weeks, hoping to accomplish something. Strychnia, electricity and general tonics were given with marked benefit to her physical condition and with some improvement of her hearing, but the total blindness remained permanent.

I have not infrequently found patients whose vision was more or less affected by quinine. A prominent physician of this state assures me that 10 grains of the drug will diminish his vision very materially, and that a continuance of the dose two or three times in succession produces an alarming diminution of sight.

In the "*Transactions of the American Ophthalmological Society*" for 1891 Dr. de Schweinitz reports some interesting experiments showing the effects of quinine on dogs. Injections, hypodermically, of from 1 to 4 grains to the pound produced blindness in from 3 to 14 hours, and an injection of 3 grains to the pound produced death in one

case. He found that the effect of quinine upon the dog's retina and optic nerve was very much the same as that upon the human subject.

Although the literature on the subject of quinine amblyopia or blindness is abundant, I find many physicians unaware of any such danger. It is to call the attention of the general practitioner to the possible bad effects of quinine that I beg leave to report this very typical case.

A CASE SHOWING IN A PECULIARLY MARKED MANNER ONE OF THE EFFECTS OF EYE-STRAIN.*

Dy G. HERBERT BURNHAM, M. D.,

F. R. C. S. Edinburgh, M. R. C. S. England, Associate Professor of Ophthalmology and Otology,
Toronto University, and Oculist and Aurist to the Toronto General Hospital and
Mercer Eye and Ear Infirmary.

George R. S——, aged 58 years, was sent to me Sept., 1894, by Dr. Millward, Grimsby. The patient gave me the following history:

Twenty-eight years ago there began a severe pain in his left eye, temple and side and back of head, which lasted more than one year. At times the pain was so agonizing that frequently during this period hypodermic injections had to be given.

At the end of this time the pain gradually lessened in violence and a few months later was gone. The sight of the eye then became very poor, that is perception of large objects merely. His head and eyes, he says, gave him no trouble till four weeks prior to consulting me, when a pain began in his right eye, temple and side and back of the head. It quickly assumed the same degree of severity, in fact it exactly resembled the pain which he had in his left eye twenty-eight years before. During these four weeks he was frequently given hypodermic injections of morphia on account of the agonizing pain. On examination I found the left eye with a normal fundus and a good deal of hyperopic astigmatism; the right was also normal, but showed a small amount of hyperopic astigmatism. I ordered glasses as follows: Distance, R. +0.50 sp. \bigcirc +0.50 cyl. ax. 180, L. +3. cyl. ax. 180°. Reading, +2.50 sp. was added to each eye. I ordered him cemented bifocals to be constantly worn and gave him no medicine.

In two months afterwards he reported to me, saying that since the use of the glasses the pain had disappeared and he had felt no return whatever. This was, of course, a very gratifying result. He felt that the change in his left eye was almost miraculous because useful vision had been restored to an eye that he believed to be blind for 28 years. The conclusion seems naturally to be that the agonizing pain in the left eye 28 years ago was due to the great efforts the eye had

* Read before the Toronto Medical Society February 18th, 1897.

made to overcome the error of refraction and secure binocular vision. With the cessation of these efforts, that is with the almost total suppression of the image of the left eye, the pain vanished. No return was *felt* till the error of refraction of the right eye, combined with the presbyopia, caused undue efforts to be made. That as fierce nerve-center explosions had been caused years ago from overstrain, these centers were much more easily aroused, than they otherwise would have been, to a display of excessive acuity. That the trouble with the right eye did not occur earlier was because the glasses he was wearing, when he consulted me, had sufficiently aided the right eye to cause a delay but not to prevent a nerve-storm. The correction of the left gave excellent vision $\frac{3}{80}+$. One question that might be asked is, why did not the pain begin before he was 30 years of age, as the error of refraction was always present? To that I cannot give any more accurate answer than that it is sometimes impossible to say when a person having an error of refraction will begin to suffer from the consequences of eye-strain. Often the effect of the eye-strain shows itself very early and again not till very much later. The reason of this is very difficult to give, but often the surroundings, occupation and certain peculiarities of the nervous system seem to be potent factors.

This case also shows the great necessity in all affections in any way connected with the head of remembering the peculiar and apparently out-of-the-way effects caused by eye-strain. In all central disturbances showing the alarming symptoms presented by the case under consideration, a most careful and exhaustive examination should be made. It is not at all derogatory to the general practitioner to say that it is impossible for such an examination to be made by him. Neurologists now seem to take a much more favorable view of many nervous affections than they once did; for they have realized that the so-called incurable structural lesions are not as great a factor in every case as they once thought. In May, 1896, I received a letter from the patient herein mentioned, who said that ever since he began to wear the glasses I ordered him in Sept., 1894, the pain completely disappeared.

I have narrated this case to impress upon the members of the medical profession the peculiar nature and very great severity of some of the nerve-center explosions due to over-strain of the eye.



OCULAR AFFECTIONS IN CONNECTION WITH GENERAL DISEASES.—A REPORT.

By ROBERT L. RANDOLPH, M. D.,

Baltimore, Md.

1. **Einiges ueber Augenerkrankungen bei Gicht.** Von Professor Dr. A. Wagenmann in Jena. (*Archiv. fuer Ophthalmologie*, Bd. XLIII, Ab. I.)

2. **The Ocular Complications of Typhoid Fever.** Charles Stedman Bull, M. D., of New York. (*Medical Record*, April 24th, '97.

I

In the last number of von Graefe's *Archives of Ophthalmology* Wagenmann has an interesting article on the affections of the eye met with in gout. He calls attention to the fact that not until quite recently have ophthalmologists attributed any importance to gout as one of the etiological factors in eye diseases. He mentions Leber and Michel as being among the first to recognize the fact that there is such a thing as a gouty eye affection. A certain amount of doubt must surround the whole subject on account of the difficulty of establishing the existence of gout in many cases, for it is known that the disease has many obscure ways of showing itself and is often ushered in by the most misleading symptoms, as for instance migraine, dyspepsia and eczema. Even a well marked acute attack of gout is not infrequently confounded with acute articular rheumatism. The diagnosis then of a gouty diathesis presents many difficulties. The fact that gout is common in England and France explains why French and English ophthalmological literature contain so much on the gouty affections of the eye. It will be noted that inflammation of the sclera and iris are most often spoken of and among those who have written a good deal on this subject are Nettleship, Hutchinson, Gauté, Galezowski and Zychon. The latter speaks of the following affections as often caused by the gouty diathesis: lithiasis of the lids, eczema of the lids, keratitis marginalis, scleritis, iritis which latter is often characterized by a great tendency to hemorrhages and is very painful, choroiditis, cyclitis, retinitis, presenile cataract, migraine with sensory disturbances and finally paralysis of the ocular muscles. Wagenmann goes on to describe a case which in many respects is interesting. There was at first a circumscribed congestion of the eyeball which lasted several weeks and

was not accompanied with any pain. Visual disturbance then followed. This visual disturbance was found to be due to a circumscribed detachment of the retina, suggesting the presence of a choroidal tumor. Three days after this condition was discovered irido-cyclitis with violent scleritis set in. Hand in hand with the eye symptoms it was observed that the general condition was suffering. Nodules appeared in different parts of the body, and these changes practically established the diagnosis, i. e. a case of true gout, and the nodules were deposits of uric acid salts. It is remarkable that the patient had never had any pains in the toe and the only evidence which existed previous to this attack was the presence of a few nodes in several portions of the body. The nodules in the sclera and fundus are to be regarded as similar in composition to the nodules elsewhere in the body. The case went on to the formation of pus in the anterior chamber. The termination of the case was rather surprising, for the inflammatory symptoms rapidly abated and finally disappeared. The retinal detachment flattened out, leaving only a discolored area to mark where it had been. The vision subsequently reached $\frac{3}{8}$. Leber has called attention to the fact that uric acid is not apt to set up destructive changes in the tissues and that such a process often rapidly recedes. The case reported by Wagenmann is certainly a confirmation of Leber's views. Wagenmann also mentions several cases where the gout manifested itself in marginal keratitis, and one case where frequently recurring chalazia might properly have been regarded as an ocular symptom of gout. Among the most interesting of the gouty eye diseases is the episcleritis periodica fugax so recently described by Fuchs and is mentioned by von Graefe and later on by Nettleship, Hutchinson and others. Fuchs does not seem to think however that this form of episcleritis is caused only by gout, for he says that any disturbance in the metabolic process, such for instance as intermittent fever or rheumatism, can give rise to the disease. Wagenmann reports several cases of this form of episcleritis. In one case the disease was characterized by frequently recurring and disappearing opacities in the vitreous body of both eyes and finally detachment of the retina occurred in one eye. Leber reported several years ago a case where repeated attacks of vitreous opacity had been relieved by the use of Carlsbad water.

A case is mentioned by Wagenmann where there was present in one eye retinitis hemorrhagica and in the other eye episcleritis periodica fugax. Most of the cases reported have been in elderly men and nearly all of them gave marked proof of having a gouty diathesis. Wagen-

mann goes on to speak of the well known connection between the gouty diathesis and glaucoma, a subject which has provoked so much discussion on this side of the Atlantic, notably Risley, Ritchie and others. In one of the cases reported by Wagenmann the glaucoma showed no improvement under the local measures usually employed in the treatment for the disease and yielded only after antiarthritic remedies had been used. Gout can light up or intensify the disposition to glaucoma by certain changes in the blood vessels, through the tendency to inflammation of the choroid and endothelial spaces as well as through the processes in the choroid which leads to rigidity of the sclera. The treatment of the gouty affections of the eye hinges largely upon the employment of the usual antiarthritic remedies, among which Carlsbad water seems to play the most prominent part in the armamentarium of the continental ophthalmologists.

II.

Bull calls attention to the fact that various lesions of the eye may occur in typhoid fever, not only during the height of the disease but also during the period of convalescence. These lesions in the order of their frequency may be enumerated as follows: *Conjunctivitis*: which is characterized by no marked objective symptoms, such as sticking together of the lids or swelling of the latter. The inflammation is usually confined to the palpebral conjunctiva and the patient complains of the lids feeling rough and hot. *Phlyctenular Conjunctivitis, Keratitis*.—There is a development of clear transparent vesicles usually along the corneal margin. These vesicles do not suppurate but ulcerate, discharge clear contents and then dry up and leave no trace behind them. These phlyctenular affections are apt to be seen in the period of convalescence.

Loss of Accommodation and Paralysis of the Sphincter Muscle (causing dilatation of the pupil) are by no means infrequent symptoms in typhoid fever. Both these conditions may occur at the height of the disease as well as during convalescence, and they are due to the general asthenic condition of the patient rather than to any lesion of the iris or of the ciliary body. *Retinal Hemorrhages*.—More commonly the hemorrhages occur in the height of the disease and they may be so extensive as to break through into the vitreous body. These cases are the ones which are usually accompanied with intestinal hemorrhages. The hemorrhages are punctate, linear and flame-shaped, and they lie in the inner layers of the retina and usually occur in the third week of

the fever. Unless at the macular region they do not materially interfere with vision. The causation of these hemorrhages is obscure. They are probably not caused by ulcerative processes such as we find in the intestines, but to what is known as diapedesis resulting from pathological alteration in the walls of the blood vessels through which the blood corpuscles escape. Neither embolism nor thrombosis is to be found in these cases, and hence there is no question of the occlusion of vessels.

A very interesting case of ocular trouble in typhoid fever is reported by Finlay of Havana (*Archives of Oph.*, vol. xxvi., No. 1). A boy of ten was in the third week of the disease when ecchymotic spots appeared on both conjunctivæ. The corneæ of both eyes sloughed out entirely and the vitreous body of the left eye became a mass of clots. The case was regarded as one of spontaneous orbital and intraocular hemorrhage. There must have been some degenerative changes in the walls of the blood vessels or, as Finlay suggested, there may have been a complicating purpura, for at one time there were to be seen a large number of ecchymoses in various parts of the body. *Paralysis of External Muscles.*—These muscular palsies almost never occur in the height of typhoid fever but during convalescence and sometimes long after. The prognosis in such cases is very good. *Retinitis or Retrobulbar Neuritis.*—This complication is supposed to be due to a more or less circumscribed meningitis at the base of the brain. Atrophy of the nerve is usually the result. The ophthalmoscopic picture resembles that of retrobulbar neuritis due to indulgence in tobacco and alcoholics. Von Peterhausen, Leber and Deutschmann report cases where the neuritis was associated with retinal hemorrhages. Defects in the visual field are very common in the period of convalescence. *Inflammation of the Uveal Tract.*—Iritis, cyclitis, and choroiditis both serous and plastic are occasionally seen in the height of typhoid fever. The inflammation is never purulent. Vision as a rule is permanently impaired, especially when either the choroid or the ciliary body is involved.



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NO. 7. NEW SERIES.

EDITORIALS.

THE OPHTHALMOLOGICAL SECTION OF THE INTERNATIONAL MEDICAL CONGRESS.

In a note in French addressed to the editors of the RECORD, the sub-committee requests that prospective readers of papers send abstracts of their contributions at once to Prof. A. Krakow, *Clinique Ophtalmologique*, Moscow, Russia, so as to insure their early publication. The subjects for discussion, proposed by the committee, will be introduced as follows :

1. M. le Prof. *von-Hippel* (Halle a S.) : "Ueber die operative Behandlung der hochgradigen Myopie."
2. M. le Dr. *Fukala* (Wien) : "Der gegenwärtige Stand der Myopie-Operationen."
3. M. le Prof. *Uhthoff* (Breslau) : "Ueber die Bakteriologie der Hornhaut und Bindohautenzündungen."
4. M. le Prof. *Reymond* (Turin) : "Valeur therapeutique des injections sousconjonctivales."
5. M. le Prof. *Hirschberg* (Berlin) : "Die Bekämpfung der Volkskrankheit Trachoma."
6. M. le Prof. *Kuhnt* (Königsberg) : "Zur Therapie des Trachoms."
7. M. le Prof. *Knapp* (New York) : "La Nature et le traitement mecanique de la conjonctivite granuleuse."
8. M. le Prof. *Rachlmann* (Juriew-Dorpat) : "Ueber den Heilwerth der verschiedenen Behandlungs-Methoden bei Trachom."
9. M. le Priv-Doc. *Niesnamoff* (Charkow) : "Principien der gegenwärtigen chirurgischen und therapeutischen Behandlung des Trachoms."

To March 25th the following titles have been announced :

1. M. le Dr. *Nieden* (Bochum) : "Ueber den Einfluss der Anchylostomiasis auf das Auge" (mit Demonstration).
2. M. le Dr. *Javal* (Paris) : "La prescription des verres doit tenir compte des variations soit favorables, soit defavorables, que peut subir la refraction sous l'influence des verres correcteurs."
3. M. le Dr. *de-Wecker* (Paris) : "Guerison artificielle et spontanee du decollement de la retine."
4. M. le Prof. *Reymond* (Turin) : "Les erreurs de projection du champ visuel dans le strabisme et leur correction educative."
5. M. le Prof. *Magnus* (Breslau) : "Die Entwicklung der verschiedenen Staarformen."
6. M. le Prof. *Stilling* (Strassburg) : "Ueber die Faserkreuzung im Chiasma" (mit Demonstration).
7. M. le Dr. *Meyer* (Paris) : "Asepsie et antisepsie dans la pratique ophtalmologique."
8. M. le Dr. *Parinaud* (Paris) : "La vision binoculaire."
9. M. le Prof. *Pagenstecher* (Wiesbaden) : "Ueber die Behandlung der Asthenopie."
10. M. le Dr. *Fukala* (Wien) : Thema vorbehalten.
11. M. le Dr. *Chibret* (Clermont-Ferrand) : "La ponction sclero-cycloirienne dans le traitement chirurgical de glaucome."
12. M. le Dr. *Galezowsky* (Paris) : "Glaucome et syphilis oculaires."
13. M. le Prof. *Nuel* (Liege) : "L'amblyopie toxique n'est pas primitivement une nevrite interstitielle du nerf optique, mais une maladie de la macula lutea."
14. M. le Prof. *Knapp* (New York) : "Considerations sur les operations de cataracte basees sur une statistique etendue d'observations et inedites."
15. M. le Prof. *Schmidt-Rimpler* (Göttingen) : "Zur Entstehung der Netzhaut-Ablösungen."
16. M. le Prof. *Angellucci* (Palermo) : "Le role de la III Epaire dans les mouvements pupillaires."
17. M. le Prof. *Angellucci* (Palermo) : "La peinture des peintres daltoniens."
18. M. le Prof. *Kühnt* (Königsberg) : "Ein Beitrag zur Anatomie der menschlichen Orbita."

19. M. le Prof. *Kühnt* (Königsberg): "Beziehungen zwischen den Erkrankungen der Nebenhöhlen der Nase und dem Sehorgan."
20. M. le Prof. *Hirschmann* (Charkow): "Ueber Abhängigkeit einiger pathologischer Process im Auge von der Störungen vasomotorischer Nerven."
21. M. le Prof. *L. Bellarminoff* (St. Petersburg): "Sur le tatouage de la cornee."
22. M. le Prof. *L. Bellarminoff* (St. Petersburg): "Organisation des mesures prises en Russie contre la cecite et les affections oculaires par la Societe *Marie* au profit des aveugles."
23. M. le Dr. *Wagner* (Odessa): "Statistik und operative Heilung des Glaukoms."
24. M. le Prof. *Th. Evetzky* (Moscow): "Zur Pathologie der Retinitis albuminurica."
25. M. le Priv. Doc. *S. Golovine* (Moscow): "Recherches sur le poids specifique de l'humeur aqueuse."
26. M. le Priv. Doc. *S. Golovine* (Moscow): "Traitement chirurgical des affections du sinus frontal."

It will be noticed that not a single paper is as yet announced in the English language. We hope that America will be further represented and that the discussions will not be entirely confined to German and French.

C. A. W.

OCULISTS AS SCHOOL INSPECTORS.

A recent New York daily contains the statement that a plan is being considered by the Board of Health of that city by which oculists are to be selected who are to supplement the work of the regular medical inspectors with the difference that while the work of the regular inspector occupies but a small part of the day "the oculists are to work right along, each in his district, in which there will be as many as a dozen schools. With ten or twelve such inspectors at work, the whole school population ought to be overhauled in the course of the year." The Board of Education are expected to be heartily in accord etc. In some respects the idea is worthy of consideration and certainly the eye, an organ of special sense of such inestimable importance to the future success of the young individual should receive at least as much if not more attention than other parts of the body, the throat for instance. The matter of the amount of light,

the direction whence it proceeds, the tints of the walls and ceiling are of supreme importance as is also the correction of the school room misfits still too common. The first of these necessities are more or less permanent and ought to have gone to make up a perfect school building as far as possible in the first place while the selection and adjustment of a suitable desk, although more nearly within the province of the hypothetical inspector, might safely be left to a person of sound judgment who has a practical interest in education. Where the child sits in the school room depends largely upon the amount of natural vision possessed, which in many cases is determined by the teachers themselves, by means of charts provided for the purpose and this answers very well, for the time being. To anyone who is at all familiar with the workings of an Eye clinic in a large city, it is easily apparent that there should be some sort of an intelligent supervision of the eyes of the growing child, and how frequently do we hear the question asked at our office, "Why is it that so many more children wear glasses than formerly?" It is with the best of intentions no doubt that this overhauling of the school children will be undertaken, and it is to be hoped that it will fall into the hands of conscientious ophthalmologists who are appreciative of the data that will be obtained. It is evidently the intention not to confine the limits of the work to the elimination and isolation of those suffering with contagious ophthalmias alone, but also to undertake the diagnosis and correction of errors of refraction, in short, to assume a serious responsibility and which will fully occupy the time allowed. The relief thus caused will of course be very acceptable to the overworked refractionist of the overcrowded charitable eye clinics; but will the innovation be equally pleasing to the practitioner who is conscious of members of certain families "in good circumstances" being diverted from natural channels? At the present time something more is considered necessary than a box of trial lenses and a card of letters for work of this sort and it will be interesting to note whether suitable provision will be made or whether complicated errors of refraction will continue to be referred to the Hospital clinics for further attention, as has been the custom of many of the teachers of the public schools who have noticed that a scholars vision is defective or that there is some unusual redness or discharge. Unless the examinations are made with care it were much better that the plan be abandoned and it does not seem reasonable to suppose that the Board of Health realize the difficulties in establishing and maintaining so many completely

appointed examining rooms in the different districts in order to carry on the work properly, nor have they probably gone into the question of mydriatics in tests of this sort. When investigation is of so great importance that each individual case should be considered separately, and not as one of a group of somewhat similar affected individuals, it should not be carried on by wholesale, so to speak, lest it become merely perfunctory, and thus possibly might not compare favorably in some instances with what is accomplished at the charitable institutions; still less can it be compared with what comes from the office of the practitioner. The responsible heads of the families to which belong the scholars attending the public schools can be classified as comprising those who are able to pay their oculist, those who are able but unwilling, and those who are unable. In the last class will be found a larger proportion of school children who are under fourteen or thereabouts, for at or about that age, the offspring of the poorer classes are put to work, and it is with these children if any that the inspectors have to do, and the benefit that they derive will be in proportion to the care and attention they receive personally, while with the two other classes the inspectors, as such, have no concern whatever. But here one is immediately confronted with a problem that has never yet been satisfactorily solved by the managers of charitable Institutions and it is not to be supposed that a Health Board will meet with any better success. The question of prophylaxis, in epidemic ophthalmias, however, and the growing importance of bacteriological research is an interesting one and it is to be hoped that with the facilities which the New York Board of Health can offer in this direction the new inspectors will be able to explain much that still remains obscure regarding the behaviour of many of the micro-organisms which are found about the eye when in a state of inflammation. W. D. H.

THE HYGIENIC SURROUNDINGS AFTER CATARACT EXTRACTION.

It is a pleasure to observe the advances in ophthalmology. We are every day casting aside old laws and adopting more modern and at the same time better methods that are more in conformity with rational principles. How often a patient tells us that several years ago he suffered from an attack of ocular inflammation, and for a number of months was confined to a dark room. Not very long ago it was customary to always put a patient to bed immediately after cataract

extraction, and the room was darkened so that it was necessary for the attendant to carry a candle to see to get about. In addition to all this the unfortunate victim's head was swathed in bandages, and over those black cloths. What was the result from a hygienic standpoint? No light, no air, and an accumulation of dirt. Is it a wonder that cases of acute mania have been reported after cataract extraction?

Certainly a room well ventilated and with sufficient daylight to enable one to see the accumulation of dirt is a much more sanitary provision for any ophthalmic patient. If it is desirable to protect the eyes from the light it can be done efficiently by local means, and not by darkening the room.

Requiring a patient after cataract extraction to go to bed for several days may not be as productive of as good results as to allow him to sit up in a comfortable chair, retiring at the proper time, when a good night's rest will be the result. What we desire for such patients is rest and quiet. Most people who are not sick do not obtain rest by being compelled to lie on their backs for several days, but on the contrary are restless and fretful. If there is anything in gravity we should not have prolapsus of the iris as frequently with the patient in the vertical position as in a recumbent position.

We find upon visiting our leading ophthalmic hospitals throughout the country, that the minority still cling to dark rooms and put cataract patients to bed as a general routine, but the majority have been converted to that which bears on its face the stamp of modern hygiene.

G. M. B.

EMPIRICISM IN OPHTHALMOLOGY.

Empiricism is yet our portion. The effect, however, upon the mind of the young oculist, of two papers relating to asthenopia recently read and reported with full discussion, is likely to be one of doubt and confusion.

The one read at the meeting of the Western Ophthalmological, Otological, Laryngological and Rhinological Association on "The Value of Weak Lenses in Moderate Errors of Refraction" emphasized valuable data, but neither in paper or discussion were the important tests for the *axial* adjustment of the eyes as much as mentioned, though it is admitted that comfortable vision requires that this adjustment conform or approximate to certain physiological standards and thus be harmoniously coördinated with focal adjustment.

Such *routine* tests, besides that for the range of accommodation, are : Those for the range and relative range of convergence ; for the muscular balance ; *and for the abduction and adduction as ascertained by carefully levelled double rotary prisms.*

Many reports of cases are incomplete or unintelligible which do not include these tests, since the reader must guess whether or not they were made, while the examiner without them can form no adequate estimate as to their ocular condition, and, fearing (as the discussion showed) that the lenses prescribed would give pain, corrects the refraction on a sort of installment plan, instead of patiently seeking the trouble in a disturbance of the relative range of convergence or some latent but potent heterophoria.

In the other paper on "Asthenopia Not due to Refractive Errors," read before the Chicago Ophthalmological and Otological Society, the author, an oculist of great ability and wide experience, stated that while he did not wish to deny that there are cases of muscular asthenopia, he had never happened to meet any of them in his practice.

The fact is, the therapeutics of muscular asthenopia, as long as the physiology of the ocular muscles remains incomplete, will be equally so ; they who believe muscular asthenopia rare will find few evidences of it, and the opposite will hold for those who do find these evidences.

Nevertheless methodical care and skill are as necessary in ascertaining the status of the axial, as are now known to be necessary as regards that of the focal adjustment, although the interpretation of, and due weight to be given to the findings of tests for the former are, at present, by far the more difficult. In the meantime many ophthalmologists hover between the horns of partial refractive correction with its temporary relief, and total correction with its chances of a discarded pair of glasses. As long as this empiricism exists the optician and so-called "ophthalmic refractionist" will now and then score against them.

F. B. E.

A PLEA FOR THE RETURN TO IRIDECTOMY IN CATARACT EXTRACTION.

The present generation of doctors is being practically taught that the simple extraction is the only operation for the relief of hard cataract. Such teaching is unfortunate, inasmuch as the extraction with iridectomy has been unwisely thrust aside, and especially as the

increased dangers of the simple extraction, the greater length of time required to effect a cure, and the consequent increased trouble and expense is an injustice to the patient.

At all of the large medical centers it has become the fashion to do only the simple extraction, and as a consequence the medical student or the young doctor in post graduate schools has no opportunity of comparing this operation, its complications and its results, with the extraction with the iridectomy.

As a natural result the majority of the younger oculists adopt this mode of operating and are surprised to find themselves confronted with many serious difficulties. A large personal experience in cataract extractions and an observation based upon witnessing the operations of a number of the most eminent operators in this country and abroad, convinces me that we should return to the iridectomy in cataract extractions, both for the convenience of the operator and the safety of the patient.

I admit that the ideal cataract operation is that which leaves a *clear* circular pupil, but every experienced operator appreciates the obstacles encountered in attaining such an end. Why jeopardize the patient's vision by reason of a prolapsed iris? Why compel him to submit to a secondary operation? Why needlessly delay the joy of restored sight, when nothing more is to be gained than a circular pupil?

At least ten per cent. of simple extractions are followed within twenty-four hours, if not immediately, by a prolapse of the iris. If it happens during or just after operating, an iridectomy is at once done, but if it had been done before the delivery of the lens it would have greatly simplified matters and diminished the dangers to the eye. To replace a prolapsed iris is sometimes difficult and always hurtful, for although the attempt is successful the iris is bruised and an iritis is almost certain to follow. It is far better to draw out the prolapse and clip it off. When the accident happens after the eye has been bandaged and the patient put to bed, the complication increases, for now the prolapse must be removed under chloroform. It would have been much better to have made the iridectomy in the beginning.

It is almost the rule after simple extraction to operate sooner or later for secondary cataract. With a narrowly contracted pupil it is extremely difficult and hazardous to dislodge and expel the remaining cortical substance. The effort to do so is liable, not only to cause a prolapse of the iris, but a loss of vitreous. Because of these accidents

I have seen many good operators content themselves with simply delivering the nucleus, leaving a large portion of the cortical, expecting to needle it later on. Quite recently a distinguished operator in one of the post graduate schools, in attempting to remove the cortical substance after a simple extraction, had such a loss of vitreous that he thought it wise to enucleate the ball a few days later. With the iridectomy all the cortical substance is easily removed by gentle manipulation and the pupil left clear and black, with but little risk of loss of vitreous. Besides there is rarely any need for a secondary operation, for every portion of the lens has been removed. It is a great injustice to the patient to endanger his vision by reason of a prolapsed iris and a loss of vitreous, and then after weeks of patient nursing send him home, to return several months later to submit to a second operation. The iridectomy almost certainly does away with these dangers and the enforced delay in the completion of the operation.

Is the acuity of vision increased by the simple extraction? After witnessing this operation by a most distinguished operator, who probably does more simple extractions than any other man in this country, the question was asked if the vision after simple extraction was more acute than that after extraction with iridectomy? The answer was that there was no perceptible difference.

In summing up, the chief advantage claimed for the simple extraction is the circular pupil and the absence of any disfiguring appearance of an operation. But over against this stand the many advantages of the extraction with iridectomy, namely, the comparative exemption from a prolapsed iris, the infrequency of loss of vitreous, the facility with which the remaining cortical substance can be expelled, thereby avoiding in great measure the formation of secondary cataract and the consequent operation, which brings discouraging delay, mental worry and additional risk to the eye.

If it is true, as has been said, that the simple extraction is the more difficult operation, what an injustice is put upon the patient in not making the iridectomy, which avoids the dangers with a greater degree of certainty and loses not a single advantage.

A. W. C.



REPORTS OF SOCIETIES.

AMERICAN MEDICAL ASSOCIATION.

Ophthalmological Section.

The meeting was called to order by the President, Dr. G. E. de Schweinitz, who said: "In the general rejoicing of the American Medical Association on its fiftieth anniversary, the Ophthalmic section heartily joins, and all the more heartily because by reason of its own clean record, steady development and fair achievements, it has become a model section—I may be pardoned if I say *the* model section—of this notable gathering of American Physicians and Surgeons. To have been chosen to preside over its deliberations is a satisfaction for which I return my sincere thanks; to become the successor of the men who have labored so hard and so productively for the advancement of this section and for the credit of ophthalmology is an honor I highly appreciate; to welcome you, my confreres, perhaps I may be permitted to say, my friends, on this occasion and all other occasions when you shall gladden us with your presence, is a pleasure I greatly enjoy." Dr. de Schweinitz then announced the subject of the Chairman's annual address to be "**Glaucoma Following Traumatism, Unassociated with Dislocation of the Lens,**" and the following is a brief abstract of his paper: "To introduce the topic the following case may be reported." The phenomena in this case were: "Contusion of the left eye ball, with slight laceration of the conjunctiva, but without dislocation of the lens; between the 7th and 22nd day after the injury, the development of the optic neuritis, quick arterial pulsation and slight increase of the intraocular tension, with marked depreciation of central vision and contraction of the field of vision; at first, improvement under the influence of eserine, associated with general subsidence of the neuritis, the improvement lasting about two weeks; later, at the end of three weeks, renewed depreciation of vision with formation of a cup in the nerve head; gradual increase in depth of the cup and the atrophy of the nerve until (treatment having been entirely disregarded) vision was reduced to nil; throughout the entire course of the affection moderate, increased tension, (+ 1) and quick arterial pulse, which persisted even when the atrophy was complete; nearly three months after the injury, the development of a ciliary staphyloma,

up and out." The author then discussed cases of glaucoma following trifling injuries, making special reference to the cases reported by Drs. Priestly Smith, Lundy, Brailey, Ferber, Knapp, and Garnier and says: "The evident conclusion of the whole matter is this,—that in these cases of traumatic glaucoma, setting aside for the moment those which cause the typical secondary variety of the disease, the lesion, so far as we may judge from microscopical examinations is similar to those which we find in the primary variety of the affection. These cases further indicate the necessity of keeping under observation patients who have suffered from the blows on the eye, even when all external manifestations have passed away, because there may develop a glaucoma which if neglected results in blindness."

The Roentgen Rays in Ophthalmic Surgery.

DR. H. M. HANSELL, PHILADELPHIA.

Dr. Hansell reports two cases of his own in which a foreign body was located by use of the X rays and reviews the cases heretofore reported by Drs. Clark, Williams, Thomson, Oliver and de Schweinitz. His method is simply to bandage a photographic plate to the side of the head and arrange the Roentgen tube in front of and to nasal side of the eye and at an angle of 45° and about 14 inches distant. He believes that in the use of the X Ray we have an accurate, reliable and speedy method of establishing the presence or absence of foreign bodies in the eyeball.

The Roentgen Rays in Ophthalmic Surgery.

DR. W. M. SWEET, PHILADELPHIA.

Dr. Sweet offers a special apparatus for taking the skiagraphs. It consists of two metallic points to be placed in front of the eye at a known distance from the cornea and from each other and a plate holder to be held at the side of the head; the whole is fastened together and held on by a head band. The Crookes' tube is placed in horizontal line, with the point which is opposite the centre of the cornea to the nasal side and about thirteen inches from the eye. A second picture is taken with the tube placed at a point below the metal points or indicators. From these two pictures, having the known distances of the indicators from the eye and from each other, the exact location of the foreign body can easily be calculated. Dr. Sweet finds by experiment that the bony walls of the orbit do not offer much obstruction to the X-rays; that the small focus point tube is to

be preferred for this work; that very minute bits of metal can be discovered; that ordinary landscape plates are all that is needed and that the exposure may not be more than four minutes.

Dr. C. F. Clarke, Columbia, Ohio, spoke of the first case he reported, in which it seemed possible to locate the minute piece of metal only by holding the plate at the internal angle of the eye. The eye was saved. He referred also to accidents resulting from use of the Roentgen Rays and recorded a case in which the hair had fallen out over the exposed region and when it grew out again was found to be white. These accidents do not appear to be the result of any particular form of apparatus and no known precautions will prevent them in a certain number of cases. Dr. Clarke has tried inserting plates into the nasal cavity, but does not know as yet whether it can be used long enough to get a good picture.

Dr. M. J. Stern, Philadelphia, advocated the simplest method of taking these pictures, that of simply bandaging the plate to the side of the head. He said the time of exposure he has been able to reduce from forty minutes to one-half minute and finds the latter time quite sufficient. He places the light at eight inches from the face, because he has found better defined pictures by that means.

Dr. Lucien Howe, Buffalo, exhibited some photographs which were taken in an attempt to determine the relative opacity of different media of the eye. The lens was found to be the most opaque.

Dr. Hale, Chicago, reported a case of a girl who had had discission performed on one eye for high myopia. A photograph was taken to determine if possible why the vision was so poor. An opacity was shown in the position of the lens and encouraged to believe that possibly some remaining cortical matter was blocking the vision, a thorough discission was done. The ophthalmoscopic picture was improved, but the vision was not.

Dr. Alling, thought the subject was of great scientific interest but that it is practically applicable to only rare cases.

Dr. Lippincott, Pittsburg, Dr. William Thomson, Phila., and Dr. de Schweinitz, Phila., each reported cases in which the X-rays had been used successfully.

In What Cases Should We Enucleate in Injuries of the Eye?

DR. J. M. FOSTER, DENVER.

Dr. Foster concludes that serious thought should be given to the operation in penetrating wounds of the ciliary region, but we should

not operate for every ciliary wound. Enucleate regardless of the situation of the wound in cases where there is marked inflammation of the injured eye and photophobia in the other; also when panophthalmitis is threatened. In panophthalmitis an early enucleation should be done for fear of meningitis, following. The time to enucleate is as soon as possible after deciding that it is necessary.

The Electro-Magnet of Haab in the Removal of Pieces of Steel From the Interior of the Eye,

DR. J. E. WEEKS, NEW YORK.

Dr. Weeks gives a detailed description of Haab's giant magnet and then relates three cases in which he used it. In the first case a piece of steel had pierced the fibrous coat at the limbus, passed through iris suspensory ligament and lodged in the vitreous humor, not injuring the lens. "Under cocaine anaesthesia the prolapsing iris and vitreous were excised, the wound was enlarged, by continuing the incision on the limbus above and below, 2 mm at each end, and by making an incision 2 mm long through the corneal tissue at right angles with this, the whole forming a + shaped wound. The patient was then approached to the sterilized point of the great magnet, and when the eye was within about 4 mm of the conical end of the magnet, the piece of steel flew from the wound and adhered to the magnet. The pillars of the coloboma were replaced, the margins of the wound adjusted and the patient recovered with V. = $\frac{3}{80}$ plus. In case 2, a bit of steel 4 mm in diameter had passed through the cornea, iris, zonular margin and lodged in the vitreous. It was successfully removed in like manner. Case 3 was not so favorable. The foreign body a piece of iron 6.5 mm by 1 mm had buried itself in the sclera beside the optic nerve and it became necessary to enucleate. Dr. Weeks thinks the instrument is not only of value in such cases, but is of service in diagnosing the presence of metallic substances in the globe as it causes pain in the region of such a foreign body, when the eye is presented to the action of the large magnet.

Discussion.—Dr. Gifford said he had one of the magnets and the greatest difficulty he had was in keeping a satisfactory supply of electricity at hand to run it. He had never succeeded in bringing out a foreign body with it, but, in some cases, he had obtained useful information from its use.

Dr. Knapp thought it was a very useful instrument if you did not have to go into the vitreous for the foreign body, because if you did,

though the immediate result might be good, the final one would not be.

Dr. Lippincott spoke of the disadvantage of the instrument's not being portable. The one he had was worked by connection with the street current. He had removed five foreign bodies from various parts of the eye and had besides found it of value in a diagnostic way.

Bacteria in the Normal Conjunctivae and the Effect Upon Them of Aseptic and Antiseptic Irrigations.

DR. R. L. RANDOLPH, BALTIMORE.

Dr. Randolph concludes: that the normal conjunctiva always contains bacteria. It is probable that the bacteria found in this locality are usually of only slight, if any, pathogenic character. It should be remembered, though, that bacteria ordinarily nonpathogenic may become harmful under certain conditions. (2.) Neither irrigation with sterilized water nor instillation of sublimate solution (1 to 5,000) produce sterility of the conjunctiva and inasmuch as both measures are futile and possibly harmful they may just as well be abandoned. (3.) In operating on the normal conjunctiva, as in cataract operations, the surgeon in the present state of our disinfecting armamentarium would do well to consider the subject of antisepsis and asepsis chiefly if not solely in connection with his hands and instruments, and of course, the cocaine and atrophine."

Discussion.—Dr. Gifford agreed with Dr. Randolph in the greater part of his conclusions, but criticised the method employed in some of his experiments. He spoke of the almost impossibility of sterilizing the conjunctiva and stated that in using antiseptics sufficiently strong to do this we run a risk of doing more harm than good, by irritation of the tissues.

Dr. Weeks thought it would be unfortunate for the impression to go out that we must forego all attempts to render the conjunctival sac as clear of bacteria as possible. He thought it advisable to make it as clean as we can.

Dr. Burnett regretted that Dr. Randolph had not extended his investigation to a study of the lashes and lid margin.

The Best Methods of Sterilizing Ophthalmic Instruments and Solutions of Myotics and Mydriatics.

DR. E. A. DE SCHWEINITZ, WASHINGTON, D. C.

The author considers formaldehyde the best agent for sterilizing both instruments and solutions. In the latter case he has found

solution of 1 to 5,000 to answer perfectly. In case of the instruments the problem is to sterilize without blunting the cutting edge or the tarnishing instrument. He has found that 1 to 1000 solution of formaldehyde used for ten minutes here answers these requirements, but he prefers even to this the use of pure formaldehyde. This is obtained by placing in a tight box or oven, a small dish of formaldehyde to which a small bit of calcium chloride is added. This results in generation of the gas. The instruments should be washed, dried and placed in this gas box and they will be sterile within ten minutes but no harm is done if they remain for hours.

Discussion —Dr. Burnett indorsed all that the author had said, as he had had the pleasure of seeing the experiments. He said that it seemed possessed of all the essential qualities of a perfect disinfecting subject and had no toxic properties. Formaldehyde is the ideal germicide, and the experiments of Dr. de Schweinitz have proven their value in disinfecting instruments beyond dispute.

Primary Sarcoma of the Iris: A Statistical Study, with Report of a New Case.

DR. C. A. VEASEY, PHILADELPHIA.

Dr. Veasey reported a case of small round-cell sarcoma, situated in the upper inner quadrant of the iris of left eye. The patient was a male, 46 years old, and the growth was successfully removed by a broad peripheral iridectomy. The report is accompanied by an interesting history of the case and the report of the pathologist of the microscopic appearances. An abstract report of 46 cases operated upon by various surgeons is then given and tables arranged to show the ages at which the growth occurred, situation, etc.

Certain Anomalous Conditions of the Iris.

DR. WILLIAM CAMPBELL POSEY, PHILADELPHIA.

The author reported a case of partial irideremia or aniridia and offers the following hypothesis regarding the genesis of such cases: "We know that the root of the iris, i. e., the marginal portion of the secondary optic vesicle from which the iris springs, is essentially a vascular tissue, consisting of but little more than a network of blood vessels supported on a delicate connective tissue, which is derived from the endothelial layer and a few spindle cells from the anterior layer. The vessels are formed through the reunion of the long and anterior ciliary arteries, which anastomose to form the major circle of the

iris. From this circle small branches are given off which run inwardly between the cornea and the lens and represent the chief blood vessels of the iris. Each of these vascular groups is surrounded with connective tissue cells which become the stroma of the iris. These vascular twigs, with the proliferating cells about them, protrude into the anterior chamber and viewed at this stage would represent to my mind, a segment quite analogous to those which have been referred to, and if the process of development stopped here, we have an appearance similar to that noted in my case, i. e., a number of more or less isolated roots or segments. Later a union of these segments occurs and the complete iris is formed. If these segments represent, as I believe, the proliferation of tissue around the twig of the major circle of the iris, then the explanation of many forms of anomalies of the iris would be a simple matter. Suppose some slight irregularity in the proper distribution of one of the twigs—corectopia would result; suppose one of the twigs entirely absent—coloboma is explained; suppose a long ciliary artery were absent, we would have a coloboma of the iris that also involves its root, the ciliary body and perhaps the choroid as well.’’

The Present Status of Jequirity in the Treatment of Trachoma.

DR. W. CHEATHAM, LOUISVILLE.

Dr. Cheatham believes that in the treatment of trachoma, weak solutions of jequirity are powerful stimulants and absorbents, and he also believes in the application of the powder directly to the parts, but he does not advocate the original method of using it, i. e., the production of violent inflammatory conditions.

Ten Years Experience with the Surgical Treatment of Trachoma.

DR. H. GIFFORD, OMAHA.

The author insists that no one of the various surgical methods is applicable to all cases of trachoma. Expression, excision, burning, scarifying, and curetting, each is of service in particular conditions. Expression should be accomplished by going over the folds (and tarsi where the latter is infiltrated) with some form of forceps, several times, with a gradually increasing pressure. Where extensive surfaces have been denuded of epithelium by the operation, adhesions between different parts of the folds can be largely prevented by keeping each lid everted for 24 hours by two sutures passed through the edge of the lid and the skin of the cheek or brow, a moist dressing well coated with

sterilized white vaseline being applied. After slight excisions of the folds no suture is necessary. After extensive excisions, including part of the tarsus, a continuous suture with the terminal knots left on the skin-side of the lid is used. For the author's expression forceps, see the original. Cases of cicatricial trachoma, excluded by many from surgical treatment, can be benefited by proper surgical removal of the slight but still active trachomatous foci which are always present. In spite of surgical measures, medical applications, in addition, are nearly always required, and in the hands of those not well versed in the treatment and diagnosis of corneal and conjunctival affections should be used to the exclusion of surgical measures.

Statistics of Cataract Operations, with Comments.

DR. H. KNAPP, NEW YORK.

Statistics may be made from different points of view. To present a faithful picture of what an operator has accomplished all his operations should be included, even if he places in an appendix a portion of them. What constitutes success and failure? We usually measure these by the visual result, and yet the surgeon is entitled to credit when the operation has gone smoothly and when, in the nature of things, little or no sight remains. It may be designated *an operative success*. It must not be assumed that good vision will result because it is the belief of the operator that the patient will have useful vision after a dissection—he must have actually secured the result.

“By means of my last 400 cases of extraction, which include every instance of extraction in my experience from Sept. 19th, 1894, to May 19th, 1897, I propose to illustrate (1) *the complications of cataract, their nature and treatment, with final results*. 57, or 14.25 per cent. showed: *Diabetes* in 6 cases, 5 smooth, 1 protracted recovery. *Albuminuria*, 2 cases, both good recoveries. *Gout*, 1, with good result. *Insanity*, 3 cases, 2 failures. *Rheumatism*, 1 case, good. *Chronic bronchitis*, cough, 2 cases, 1 good, 1 failure. *Traumatism*, cases, good. *Foreign body in lens*, 1 case, good. *Chronic dacryocystitis*, 6 cases, 3 good, 3 failures by suppuration. *Excessive myopia*, 4 cases, good. *Synchisis*, 3 cases, good. *Choroiditis*, 3 cases, smooth recoveries. *Chronic irido-choroiditis*, 8 cases, 7 satisfactory and 1 failure. *Maculae corneae*, 4 cases, good. *Chronic glaucoma*, 3 cases, smooth recoveries. *Optic nerve atrophy*, 2 cases, recoveries good. *Congenital nystagmus*, 1 case, good. *Chalky lens*, dislocated into

anterior chamber, good operative result. *Syphilis*, 1 case, good. *Extractions with iridectomy* were made in 56 cases, or 14 per cent. I was induced to do this among the 400 series in 9 instances on account of *tendency to iris prolapse*; in *glaucoma*, 2; *diabetic retinitis*, 1; *albuminuria*, 1; *insane*, 1; *profuse hemorrhage into anterior chamber*, 2; *unmanageable patient*, 8; *iris fell over knife*, 5; *rigidity of iris sphincter*, 1; *loss of vitreous*, 1; *no reason stated*, 5; *peripheric section*, 2; *synchysis*, rupture of ligament, lens tremulous or dislocated, 9; *iritis, irido-cyclitis and irido-choroiditis*, 5; *bruising of iris*, 1; *splinter of wood in lens*, 1; *to remove thickened capsule*, 1. Of these 56 cases 15 secondary operations were done. The final results were: V. = $\frac{20}{100}$ to $\frac{20}{100}$ in 43; moderate, $\frac{20}{100}$ to $\frac{18}{100}$ in 6 instances.

Reactive Processes.—*Mild iritis*, 6 cases, with good results. *Protracted irido-cyclitis*, 2 cases, ending in $\frac{20}{100}$ and $\frac{0}{100}$. *Post-operative hemorrhage into anterior chamber*, good. *Slow closure of wound*. V. = $\frac{20}{100}$. *Partial infection of wound*, 2 cases. V. = $\frac{20}{100}$ and $\frac{0}{100}$. *Total suppuration*, 4 cases, V. = 0 in all. *Anterior Synechiæ*, a goodly number of *small adhesions to the scar*, not interfering with vision or healing. One ended in glaucoma. *Prolapses of iris*, 26 cases (7.6 per cent.), mostly occurring the first night, abscised as soon as discovered, examining the eye daily. Visual results were good in every instance, except one where cough was present.

There were 160 *after operations*, 40 per cent.: *Enucleation*, 1 case for unrelieved glaucomatous irido-choroiditis. *Iridectomy* in one case of glaucoma following extraction and in three following discission. *Extraction of thickened capsule*, 2 cases.

Discission, 153, or 38 per cent., with marked improvement of vision in all but a few instances where V. remained as before. Glaucoma followed in 4 cases. On the repetition of the operation in one of these cyclitis set in, but was checked by the iridectomy and excellent sight was regained.

The visual acuity was as follows: $\frac{20}{100}$ to $\frac{20}{100}$, 35 cases, or 90 per cent., good results; $\frac{10}{100}$ to $\frac{18}{100}$, 29 cases, 7 per cent., moderate; failure in 12 cases or 3 per cent. The usual results of the previous 600 cases (not before published) were as follows: Good vision, 572, or 95 per cent.; moderate, 16, or 3 per cent.; failures, 12, or 2 per cent. The second series showed somewhat better results, but 30 cases, or 5 per cent., were, in addition, omitted as offering too poor a prognosis. These should be considered in comparing the two series. Adding the two

together we get good vision in 93.1 per cent., moderate vision in 4.5 per cent., and failure in 2.4 per cent.

Prolapse of the iris occurred in 55 cases (10.3 per cent.) out of 548 in the first series of simple extractions. In the second, 26 cases occurred in 343 cases, or 7.67 per cent. There were 81 in 891 simple extractions, or 9.1 per cent. Of the 55, 49 got good vision, 2 moderate. Two lost sight in the eye operated upon and two lost sight in the opposite eye from sympathetic ophthalmia. This rare complication occurs when the iris is wounded and happens oftener in the combined than in the simple operation. *Secondary operations* were performed in 66 per cent. of the first series and in 44 per cent. of the second.

Shot-grain Wounds of the Eye.

DR. L. H. TAYLOR, WILKESBARRE, PA.

Dr. Taylor reports three interesting cases of gunshot wounds of the eye, in all of which he succeeded in saving the eye, and in two of them there was useful vision. He considers the question as to why these wounds seem to be less dangerous than other penetrating wounds of the globe, and concludes: "1st. That gunshot wounds of the eye are less dangerous than wounds of similar severity from many other causes. 2nd. That in general an eye wounded by gunshot grains, unless the wound be one of unusual severity, should not be immediately enucleated, but should be treated conservatively under observation. 3rd. A patient with a wound of this character should rest in bed for a period of two weeks or more, and the wound be treated under the most rigid antiseptic precautions."

Discussion.—Dr. Kollock spoke of the fact that gun-shot may pass entirely through the eyeball and remain in the orbit without giving much trouble. He said that if the shot remained in the eye there was not apt to be ecchymosis of the lids as would occur if the shot was in the orbit.

Dr. Casey Wood said that some years ago he had reported a series of these cases in the *American Journal of Ophthalmology*, and had come to nearly the same conclusions as Dr. Taylor. "I then advanced the idea that shot grains were probably aseptic at the time of penetrating the eyeball. It seemed to me that the friction of the shot in passing through the air rendered them sufficiently aseptic to account for the condition that occurs after the trauma.

Dr. Randolph believed that Dr. Wood had really explained the matter and called attention to the experiments of Le Garde and men

tioned the negative results he had obtained on firing into culture media.]

Dr. Gifford called Dr. Randolph's attention to the fact that the same investigator also reported a number of positive results, and that the conditions surrounding the ordinary bird shot were different from those of the bullet in the smooth bore rifle. He thought the chemical properties of the shot more important than the asepsis.

The Implantation of a Glass Ball for the Support of an Artificial Eye, and Mules' Operation for the Substitution of Eucleation of an Eyeball.

DR. L. WEBSTER FOX, PHILADELPHIA.

My method of performing implantation is as follows: After incising the conjunctiva and tissues of the orbit in the horizontal direction, corresponding to the diameter of the glass ball to be inserted, the upper lip of the conjunctiva is raised, and with a sharp-pointed, curved scissors the conjunctiva and sub-connective tissue that lies close to it is dissected off in all directions, making a pouch into which the glass ball will fit. On account of the vascularity of the parts, considerable bleeding follows this dissection, but it is easily controlled by pressure. The glass ball is then inserted into the cul-de-sac with the injector. The edges of the conjunctiva are brought together by five or six stitches. Experience has taught me that it is well to keep the pressure bandage over the orbit from 48 to 72 hours.

The method of performing Mules' operation is this: The eyelids are separated with the ophthalmostat. The conjunctiva is dissected off from its corneo-scleral attachment back to about the equator of the eyeball, the muscles are also separated; then the cornea is excised. This is best done with a large Beer's knife, as if performing a flap operation for cataract; the lower half of the cornea is removed with curved scissors and the contents of the globe are taken out with a small scoop devised for the purpose. Great care is necessary to remove the ciliary body and choroid and head of the optic nerve, leaving a clean white sclera. The cavity is then packed with sterilized gauze to prevent hemorrhage, and when after a few minutes this is removed the cavity is thoroughly irrigated with antiseptic fluid. A sterilized glass globe is then inserted with a specially devised instrument. The sclera is split vertically so that the edges may be drawn together and held by

stitches of No. 4 black silk, completely hiding the glass ball. As a rule, the conjunctival sutures are not removed until six or ten days.

The total number of operations performed up to the present writing number 82, and so far as I have been able to keep trace of them no serious results, such as sympathetic irritation, or meningitis, have followed. I may say, like Brudenell Carter, "That I am performing this operation with increasing pleasure on every available occasion."

Discussion.—Dr. Allport said that from his experience he thought this operation had come to stay and that we could not disregard its improved cosmetic effect. His operations had all resulted favorably, his greatest difficulty having been in obtaining satisfactory artificial shells after the operation.

Dr. Risley—"I am convinced that this is not only a justifiable and highly interesting operation, but one to be commended in prudently selected cases. In a large number of patients the operation presents many advantages over enucleation." His technique differed slightly from that of Dr. Fox.

Dr. Thompson was inclined to favor the old conservative operation.

Dr. Pick read a paper in which he related some experiments upon rabbits to show that rubber balls might be used instead of the glass ones.

Dr. Prince suggested that the silver ones might be better because of the fact that in the presence of granulation tissue they would become coated with silver lactate, which is a good antiseptic.

Drs. Ring, Friebis and de Schweinitz each gave testimony favorable to Mules' operation.

A Report of Thirty Cases of Cataract Extraction with Reference to the Treatment of Prolapse of the Iris in Simple Extraction.

DR. L. F. LOVE, PHILADELPHIA.

The writer is of the opinion that the adoption by modern ophthalmic surgeons of strict asepsis and antisepsis, where necessary, has made simple extraction of cataracts more popular at the present day. The great drawback being the danger of prolapse of the iris, which the most skillful surgeons acknowledge to happen in from six to eight per cent., led to inquiries being made of a number of prominent

surgeons both in this country and in Europe. The consensus of opinion was that the prolapse should be cut off as soon as discovered, that is, if discovered in the first two or three days. If the prolapse be small and does not appear until later it is allowed to remain. Dr. Love is of the opinion that prolapses are frequently caused by the failure of the surgeon to thoroughly remove all cortical matter, and especially dangerous is the clear cortical matter. The paper enters into detail as to the management of the cases before and after operation and gives a list of thirty cases, twenty of which were done without iridectomy.

Treatment of Glaucoma.

DR. DUDLEY S. REYNOLDS, LOUISVILLE.

The conclusions of the author are as follows :

(1). Incipient glaucoma is frequently relieved by improved nutrition, with correction of any existing errors of refraction ; it is sometimes relieved by the iodide of potassium, associated with the local use of eserine drops. (2). Mild and insidious cases of inflammatory glaucoma, between paroxysms, may exhibit but little tension. They require iridectomy for the drainage of the engorged vessels during the paroxysm, and constitutional treatment to aid in the elimination of accumulated debris in the tissues. (3) Inflammatory glaucoma, excluding the traumatic cases, should be accepted as a manifestation of many diatheses ; and, whilst iridectomy should constitute a necessary part of the treatment, it should not be done to the exclusion of the all important constitutional measures. (4). Since iridectomy can accomplish nothing beyond the establishment of drainage for the vessels of the iris and contiguous structures into the aqueous chamber, the amount of iris removed should be small. The operation should not be repeated and, in any case, supplemental constitutional treatment is imperatively demanded. (5). In all cases of increased tension of the eye with peripheral contraction of the field, engorgement of the retinal veins, with or without cupping of the disk, constitutional treatment is necessary, and, above all, strict attention to the general nutrition and habit, of the patient.

Secondary Glaucoma.

DR. S. D. RISLEY, PHILADELPHIA.

Dr. Risley gave " the history of two cases which illustrate widely diverse types of disease, each leading up finally to the symptom-group we call glaucoma." Case 1.—Plastic irido-cyclitis ; annular synechia

and occlusion of pupils ; secondary glaucoma ; iridectomy ; recovery with moderate vision. Case 2.—Uveitis—secondary glaucoma. It is obvious that from start to finish we have two essentially different types of disease portrayed in the history of these two patients, but, nevertheless, culminating in a common group of symptoms depending upon a mechanical condition which required for its relief the same mechanical interference. In case 1 the increase of tension was due to the exudate and fluids imprisoned behind the iris and by the closure of the angle of the anterior chamber. In case 2 it is probable that the anterior excretory channels were clogged by the profuse albuminous exudate. The disease first manifested itself in and around the papilla and spread forward, gradually manifesting all the conditions ordinarily present in so-called sympathetic ophthalmia of the serous type.

Discussion.—Dr. Hotz discussed the theories of glaucoma and said that he considered the work of Treacher Collins as of the greatest importance. He thinks that the ciliary processes are glandular structures, and if these observations are confirmed we have a very important discovery.

Dr. Allport criticized the position taken by Dr. Reynolds, particularly in reference to the connection between glaucoma and the gouty diathesis.

Dr. Casey Wood related a case of secondary glaucoma following traumatism.

Dr. Connor defended the position taken by Dr. Reynolds and considered the manner in which improvement was brought about by iridectomy.

After Treatment of Cataract with Special Reference to the Use of Germicides.

DR. J. A. WHITE, RICHMOND.

Dr. White is of the opinion that the eye will get along best with the least possible interference during the ten days immediately following the operation. The best way to keep the eye at rest is by a properly adjusted packing of sterilized gauze, or absorbent cotton over both eyes, held in place by a bandage of strips of plaster, and by confining the patient to bed. The best way to prevent injury to the eye is by a protective mask. The author considers the possibility of a sterilizing the conjunctiva and says that he is "in the habit of using sterilized vaseline before and after the operation. The vaseline is boiled ten minutes and to each ounce is added $\frac{1}{6}$ gr. of bichloride of mercury and an equal

quantity of chloride of sodium, well rubbed in while cooling. Twenty-four hours prior to the operation the eye is thoroughly washed with a sublimate solution, 1 to 5,000, filled with sterilized vaseline and sealed with antiseptic dressing. This is removed on the operating table just before extraction. During the operation the eye is flushed with sublimate solution, 1 to 5,000, and as soon as it is completed is filled with the vaseline and dressings applied. In regard to subsequent dressings I find that some change them every day and others more seldom; some not at all during the first week. It would seem that more than one road leads to Rome. If prolapse occurs immediately after the operation, I think it is better to do a regular iridectomy at once because if returned it usually prolapses again, but, if it be not discovered until the first removal of the dressing, my experience is that it had better be let alone. If infection of the wound occur I know of no sure way of preventing a bad result."

Best Methods of Preparing Dressings for Cataract Cases, and Their Character and Composition.

DR. CASEY A. WOOD, CHICAGO.

I must confess that I feel very much like dissenting from the proposition implied in the title given to this communication, because I am in considerable doubt as to whether there is any *best* method of preparing dressings for the average cataract case. My own experience and the results that I know others to have obtained, teach me that when a cataract extraction has been deftly and completely accomplished, when the lips of the corneal wound have been carefully approximated and when no intraocular debris rests between the latter—when, in other words, the operation leaves nothing to be desired the dressing is of little or no importance. In such a case it is of no moment whether the lids be simply closed with a strip or two of isinglass plaster or whether the eye be subjected to the elaborate toilet recommended by many distinguished writers and teachers. If the operation be correctly done, it matters not whether the dressing be negatively aseptic or positively antiseptic. If, however, the operation fails in any one of these important particulars, the question may well arise as to what description of dressing is most likely to assist repair of the surgical traumatism, by preventing extra ocular infection of the wound and by favoring apposition of the margins of the wound. The first indication is probably best met by some covering for the eye that, while not entirely excluding ventilation, will be sufficient to prevent the

entrance of morbidic germs and irritating dust. It should also be sufficiently absorbent to take up the tears and mucus that commonly flow from an eye that has been recently operated upon. I have been unable to convince myself that a dressing impregnated with germicides of sufficient power to destroy any pathogenic organisms that have lodged in and about the eye does not do more harm than good. No dressing should be depended upon to do the work of sterilizing the conjunctival sac, lids or lid edges. If this be attempted, the hyperaemia which the bactericide generally sets up is, at least positively harmful in the great majority of cases. What good purpose is subserved by the attempt, so often made, to keep the corneal margins *in situ* by the use of bandages and other appliances? You are all well acquainted with these devices—the little rolls of cotton (aseptic and antiseptic), the simple roller, starch bandages and other appliances of a similar nature. I have tried and discarded all of these as I have found them entirely unnecessary in uncomplicated cases of extraction and never saw any good come from their employment even when in times of trouble, a mechanical support seemed desirable. In my hands sufficient protection from external irritants combined with an effective provision for the absorption of post-operative discharges may be secured by the following dressing; carefully sterilized and rolled in a sterilized towel until the moment of application. It is far from being original with me. A sheet of well prepared cotton, 4 mm is placed upon two thicknesses of simple moist gauze and these are together cut so that when placed upon the eye their circumference overlaps by 5 mm, the irregular circle of the orbital margins. Three strips of adhesive plaster, 2 cm wide and 10 long are made to hold this dressing in place, in such a fashion that none of the cotton or gauze projects beyond the edges of the plaster. The strips form a triangle one side of which runs parallel or almost parallel with the nose, the base corresponds to the supraorbital ridge and the third joins the unattached ends of the other two. Such a dressing filters the air passing to the eye, of its germs and dust; it is comfortable to the patient, does not press upon the eyeball and readily absorbs lachrymal and other secretions. It does not, like the roller, starch and antiseptic bandage encourage vascular congestion and, finally it may be impregnated or smeared with any agent that the surgeon cares to apply. Neither the patient nor his officious friend is at all likely to succeed in removing it, although the surgeon may examine and drop collyria into the eye by simply detaching and raising the lower point of the triangle. What

can be more provoking to the surgeon than to find, after obtaining a good operative result, that a careless nurse or a restless patient has added a newly opened corneal wound, a hernia of the iris, or loss of vitreous, to his other anxieties? A finger thrust, a pillow-end jammed into the eye, a slight blow upon the globe, or any other of the dozen little accidents that happen to a person with imperfect vision moving about in darkened rooms, may nullify the most brilliant and correct efforts of the operator.

Especially when night comes on, or when the patient begins to move about, the eye should be protected from injury by some sort of a shield or mask. Fuchs uses the wire-woven protector, introduced as long ago as 1883. There are many modifications of this mask in the market, one of the best of which has been suggested by Frothingham & Würdemann. Certain operators who make use of the roller bandage gain protection by starching the dressing. When this has dried, the eye will receive a considerable blow without injury. Snellen has lately used a turtle-shaped aluminium shield, about ten centimeters long and five wide, placed over the eye and held in position with strips of adhesive plaster; it forms an admirable protector. One of the best shields I am acquainted with is the papier mache half-mask, which when carefully adjusted to the nose and surrounding parts makes a light, comfortable and effective protector. A small portion of the patients object to wearing any sort of mask, claiming that it prevents them from sleeping and makes them nervous. In such cases I find that one may very well get along with a large, stiff and very concave eye-shade placed over the dressing and held in place with piece of rubber plaster.

Discussion.—Dr. Knapp said that he considered the object of the bandage was to immobilize the eye, and that for this purpose there was none better than the old binoculus. He more frequently used, however, a pad of gauze and cotton, which was applied moist and held on by plaster strips. It adapted itself better to the lids when moist than if put on dry. After simple extractions he always examined the eye the next day, so that if there was a prolapse it could be readily cut off and the operation thus converted into a combined one.

Dr. Standish spoke of cataract extractions in cases where there was a blenorrhoea of the lachrymal sac and mentioned such a case in which he had used iodoform with great success.

Dr. Conner demonstrated a method of bathing the eye and lids, which consisted in filling a tumbler with hot water, bringing it close against the nose and by dipping forward immersing the eye.

Dr. Lippincott exhibited a small box which he had prepared for the purpose of sterilizing plaster.

Dr. Hotz announced that he was still in favor of bandaging both eyes after cataract extraction.

Angio-myxoma of the Orbit, with Report of a Case.

DR. S. C. AYRES, CINCINNATI.

Mrs. M., aged 64, was first examined by me in February, 1896. She states that the tumor in the right orbit was first noticed eighteen years ago. It began at the upper outer angle in the region of the lachrymal gland and its development has been very slow. It fills the upper outer portion of the orbit, pushing the eye out and down; the proptosis being so great that the posterior portion of the globe is almost on a line with the bridge of the nose. The outline of the tumor can be made out on forcibly drawing up the upper lid. The lower lid was oedematous from pressure. The eye has never given any pain.

The outer commissure was severed and the adhesions around the tumor separated. The attachment of the growth was to the outer portion of the orbital wall. Its removal was accomplished without sacrificing the ball, but there was such excessive hemorrhage that it became necessary to enucleate it. Microscopic examination proved the tumor to be an angio-myxoma.

Cavernous Tumor of a Lid with Extensive Conjunctival Involvement.

DR. G. ORAM RING, PHILADELPHIA.

The patient, a female aged eighteen months, was seen with naevus of the right upper eyelid. At birth there existed only a small mark about the size of a pin-head which has gradually increased in size. It has been operated upon by another surgeon by the method of ligation; in one week it sloughed off and the ulcer healed without difficulty, but a protrusion of the mucous membrane soon began and reached the condition presented when Dr. Ring first saw it, nine months after the first operation. The mass then involved the conjunctiva and extended well up in the retro-tarsal folds.

Electrolysis has been tried five times, but with very slight success. The application of ethylate of sodium as suggested by Snell is being tried now.

Discussson.—Dr. Weeks spoke of the nature of these cavernous angiomas as being usually sarcomatous and said that he followed the

advice given him some years ago by Dr. Knapp to remove them thoroughly and as soon as possible.

Melano-Sarcoma of the Conjunctiva, with Report of a Case.

DR. A. R. BAKER, CLEVELAND, OHIO.

Mr. G., aged 69, first seen in '88 with a dark purplish, lobulated tumor of the left eyeball about three-quarters of an inch in length, one-half in breadth and one-half inch in thickness, springing from the ocular conjunctiva on the nasal side. The tumor had first been noticed one year previously. There was no history of traumatism. The tumor was large enough to prevent rotation of the eye to the right and hence there was no diplopia when looking in that direction. The tumor increased rapidly in size and a few months later patient consented to operation. A formidable operation was anticipated, but the tumor proved to be pedunculated and very superficially attached to the conjunctiva and hence was easily removed. Three years after the operation patient was in perfect health and vision perfect in both eyes. The tumor was examined microscopically and found to be a small-celled melano-sarcoma with much pigment. Five years after the operation the patient died with cancer of the liver.

The Relative Infrequency of Trachoma in Southern California.

DR. H. BERT ELLIS, LOS ANGELES, CAL.

This inquiry was sent to the leading eye men of the southern part of the State: "In your ophthalmic practice have you observed trachoma frequently? In about what per cent. of your cases?" Every one replied that trachoma was relatively infrequent in this section of the country. The percentage averaged from one to two per cent. In my own practice, extending over a period of eight years, I have had less than one per cent. of trachoma, including both my private work and college clinic. Why it should be so I do not know, but the following facts may throw some light upon it. We have a cosmopolitan population, but mostly Americans. In no part of our state are the inhabitants crowded. The great bulk of the population lives within twenty-five miles of the ocean and at an elevation of less than a thousand feet. The climate is such that an outdoor life is the rule, and this fact with a relatively good sanitary condition helps to render our poorer citizens comparatively healthy, and they are enabled to resist, or rather they are rendered less susceptible to contagion of any kind.

The Surgical Treatment of Trachoma, with Special Reference to Expression and Grattage.

DR. J. E. WEEKS, NEW YORK.

Dr. Weekes described the method he had found most useful as follows: "All operations for marked trachoma are done under general anæsthesia. Cocaine is not sufficient, and if used results in giving the patient unnecessary pain and unduly hastens the work of the operator. The margin of the lids, after thorough cleansing, are turned over roller forceps to expose the whole surface of the conjunctiva. With a scarificator bearing three Demarres blades superficial incisions parallel to the margins of the lids are made in the trachomatous tissue; the contents of the follicles are then evacuated by a gentle stripping motion with a Noyes' or Knapp's forceps. A solution of bi-chloride, 1 to 500, is then applied by means of a moderately soft tooth brush, and the conjunctival sacs are irrigated by a solution of bi-chloride, 1 to 5000, and finally an ointment of bi-chloride in vaseline, 1 to 5000, is applied to the conjunctival surfaces. The eye is bandaged and left for twenty-four hours, and on removing this a layer of plastic lymph will be noticed over the conjunctiva, and there will be a tendency to adhesion between the layers of conjunctiva that oppose each other. Cocaine is applied and all adhesions broken up by means of a probe without disturbing the lymph layer any more than is necessary. This membrane is cast off in a few days, showing a very satisfactory condition of the conjunctiva. The advantages that this method possess are: first, the easy removal of the trachomatous tissue; second, the thorough antisepsis without deterring the healing process; and third, recovery with a smooth surface and with a minimum of contraction."

A Comparison of the Value of Local Medicinal Measures in the Treatment of Granular Conjunctivitis (Trachoma).

H. V. WÜRDEMAN, M. D., OF MILWAUKEE, WIS.

The author in order to scientifically discuss local applications shows that the diseased process should be considered. The alteration of the epithelium is the only constant anatomico-pathologic phenomenon, the stages of its destruction should be noted in the treatment of the various processes coming under the head of trachoma or granular conjunctivitis.

1st. stage. Epithelial proliferation with a catarrhal condition due to hyperplasia and increased function. Treatment is detergent and antiseptic.

2nd. stage. Superficial destruction of epithelial elements, which may be reproduced by reorganization. Treatment applicable to this stage, removal of hyperplastic tissue, together with absorptive, stimulative and antiseptic measures.

3rd. stage. Total destruction of epithelium. The relief of sequelæ, complications and stimulation of remaining epithelium to aid in resorption of cicatricial tissue and regeneration of new epithelium.

4th. stage. The result of disease, Xerosis, an incurable condition whose symptoms are relieved by emollients.

The prophylactic, hygienic and constitutional measures are dwelled upon in a general way. The treatment is at first all directed toward removal of causes of destruction of epithelium, then to affect its regeneration. The removal of hyperplastic tissue and products of inflammation by mechanical or surgical means if necessary, relief of asthenopic symptoms, complications and sequelæ. Under detergents and antiseptics, boric acid, bichlorid and cyanid of mercury are recommended in above order for patients' own use. Stronger solutions guarded by antipyrin, weak cocain, eucain or holocain are gratefully borne and useful. Ung. hydrarg. oxid. flav. and ung. ichthyol are stimulative as well as antiseptic. Brushing with nitrat of silver, bichlorid, lactic acid cause considerable reaction and stain the conjunctiva if long continued. Argentamin, cyanid of mercury and boroglyceride are free from above objections. Tannate of quinin, antipyrin and resorcin in solution or dusted on conjunctiva are antiseptic. In the acute inflammation, iced applications and cold bathing together with silver compounds are used. Congestion is limited by cocain, eucain or holocain with boric acid or sodii biborat. Under stimulants: Hot water bathing, with or without antiseptics and silver, mercury, copper and zinc compounds, not strong enough to corrode epithelium. Nutrition is increased by massage with ung. hydrarg. oxid. flav. Stimulation of nutrition may be effected by massage with impalpable boric acid, iodoform, calomel or aristol. Application of pumice stone, installation of crude petroleum, ichthyol, boric acid and resorcin, glyceride of tannin act as stimulants, as also do alum, copper, silver, lapsus divinus and ammonium muriat. Jequirity in weak solutions causes absorption by hyper-stimulation. Myotics and mydriatics are used in the complications such as pannus and ulcerative keratitis. Eserin acts as a stimulant, atropin as

a sedative, scopolamin and duboisin may be substituted. Massage with mercuric ointments or stimulating powders are most beneficial for sequelæ, causing absorption of cicatrices and leucomata. Most applications are better borne if a weak local anesthetic is used first. The application of silver salts should be followed by solution of sodii chlorid to prevent continued action. Strengths of drugs and methods of application are minutely described. The author lays a special stress upon massage with a *complete* eversion of eyelids so that fold of transmission is thoroughly exposed to view. The medical treatment, although tedious, is attended by gratifying results, but in most cases should be combined with surgical measures.

The Surgery of Trachoma.

DR. L. S. ZIEGLER, PHILADELPHIA.

Surgical procedures for the relief of trachoma are only indicated in the chronic stage of the disease and especially for the relief of the complications and sequelæ. Without going deeply into the etiology of trachoma there is no doubt but that the essential elements in its persistence are the partial occlusion of the tear duct with consequent epiphora, the regurgitation of septic secretions, the perversion of the ocular secretions, the masceration of the cornea from the excessive amount of the secretion and discharge present, and finally friction from tarsal pressure with erosion of the corneal epithelium. The tear duct, even if it were not originally at fault, through participation in the inflammation and subsequent contraction, with a like perversion of the secretions within its lumen and the partial abolishment of its capillary action due to its thickened mucous lining and viscid contents, not only prevents the tears from passing downwards, but really adds to the trouble by the constant regurgitation of these septic secretions. The first object to be accomplished then is to secure a patulous tear duct by means of rapid dilatation, and without any incision of the tissues, as the latter only leads to subsequent cicatricial contraction. Then by the operation of canthoplasty to relieve the lids from friction and at the same time the tendency to masceration. Ordinarily no other treatment will be required if these two things have been performed thoroughly. For relief of the granulations themselves slight scarifying of the lid followed by the use of Knapp's roller forceps will usually accomplish all that is desired. The local treatment to be applied to the mucous membrane itself should be of a mild astringent character.

The Hygiene of Trachoma and the Relation of Altitude and Climate to its Development.

DR. S. M. BURNETT, WASHINGTON.

To establish efficient rules for the hygienic management of disease it is first necessary to have some definite ideas about its causation, the condition of the subject and the environments most conducive to its development. We have not yet arrived at the unanimous acceptance of the microbic origin of the disease. The most diligent research has failed to find a microbe which any considerable number agree upon as the bacteria of trachoma. Some hold that the disease is essentially one of the adenoid tissue of the conjunctiva. The facts that have been elicited from a systematic investigation of the prevalence of trachoma among different people shows such a disparity among them that we are compelled to consider race as an important factor in the establishment of a predisposition to the disease. With the acceptance of the theory of a dyscrasia as probably the essential character of the affection our ideas in respect to its hygienic management must differ somewhat from those based on the theory of a purely contagious nature. As however the idea of a dyscrasia has been considered seriously only within a very recent period our knowledge of the nature of the predisposition is as yet very limited. It must be borne in mind that here as in all cases of a supposed microbic origin, even with the acceptance of a dyscrasia, we have to consider not only the micro-organism but also the soil in which it grows. A large number of pathogenic organisms we have everywhere in the conjunctival sac in perfectly healthy eyes, organisms that if they were sufficiently numerous and the conditions for their growth favorable, would in a short time set up morbid processes. Heretofore we have been directing our attention almost entirely to the microbe and to the almost utter neglect of the soil on which it grows. The first law therefore in the treatment of trachoma and the prevention of it in those predisposed is the avoidance of causes which are likely to lead to such an inflammation. They should be kept apart from those suffering from any form of contagious ophthalmia, badly ventilated quarters should be avoided and such patients should be kept out of all forms of irritating atmosphere. The effect of climate has not yet been studied sufficiently to enable us to form a just estimate of its significance. As a rule countries bordering on the sea are less affected, probably because of the absence of dust. Altitude alone does not give immunity.

The Treatment of Mal-position of the Lid Borders in Trachoma.

DR. F. C. HOTZ, CHICAGO, ILL.

Dr. Hotz says: "The first condition for a rational operation for entropium that we should insist upon is that we should always take into serious consideration the cosmetic effect of the operation. Every case can be rectified without the least mutilation. The second condition is that the most rational method of relieving the entropium is to remove those structural changes which cause the inversion. These structural changes begin in the anterior edge of the lid margin; the lashes first show a drooping, then a fold of skin just above their roots becomes lax, and later the orbicularis muscle, through repeated spasms, takes part in the dislocation. The following operation solves the problem here presented: The lid skin being put on the stretch an incision from canthus to canthus is made through the skin and muscle a little below the upper border of the tarsus. The skin and muscle is dissected from the tarsus down to the root of the lashes and the muscle fibers covering the upper border of the tarsus are excised. The lid skin is drawn up over the tarsus and fixed at its upper border by three silk or catgut sutures, which inclose within their loops the skin borders of the incision and the tarsal border and therefore when tied, close the original wound and establish a firm union of the skin with the tarsus. If the cartilage is so small that the incision has necessarily to be made very close to the ciliary margin it may be well to do a further operation, that of making an intra-marginal incision and filling the marginal wound with grafts of skin or mucous membrane; I prefer the former."

A Clinical Study of Hyperphoria.

DR. J. T. CARPENTER, JR., PHILADELPHIA.

The author makes a strong plea for the better classification of muscular abnormalities and for the study of their relation to the general diseases or to nervous disturbances. He offers the following classification which he has found to some advantage in his daily work as an aid to the clinical study of hyperphoria:

1. Spurious Hyperphoria, including:

- A. Hyperphoria due to general disease—gout, etc.

- B. Hyperphoria appearing in disease of the central nervous system.

C. Hyperphoria secondary to abnormal refractive or muscular states.

2. True Hyperphoria, including:

A. Concomitant.

B. Spasmodic.

C. Paretic.

He considers at some length and in an interesting manner the symptoms produced by the various conditions, and their causes, and concludes: "It is essential at the outset that a distinction should be made between true and spurious hyperphoria. It is absolutely imperative that before deciding upon any line of treatment for hyperphoria a careful and accurate examination of existing anatomic conditions should be made, which should include estimation of refraction, determination of tension of the extra-ocular muscles as indicated by their ability to overcome diplopia produced by prisms properly placed, measurement of the fields of vision, monocular and binocular, and the employment of all the tests which tend to remove the strong impulse to binocular single vision and reveal latent defects, such as the red glass, Maddox rod, etc. Treatment should be directed against the underlying causes after determining whether the defects be due to spasm, paresis or ocular over-action from anatomic conditions. Tenotomy is indicated only on muscles showing too great power. Advancement or muscular shortening in cases revealing weakness of a muscle, or, at least, no overwhelming power in its antagonist. There is urgent need for a more satisfactory classification of the entire subject of motor anomalies.

"Amblyopia Exanopsia."

DR. A. C. SIMONTON, SAN JOSE, CAL.

The writer reports a case of convergent squint with partial amblyopia, the vision being reduced to $\frac{2}{200}$ in one eye and $\frac{1}{60}$ in the other. The child was 8 years old and a tendency to squint had existed for three years. An over-correction of the hypermetropia was made and under the use of glasses vision which at the best when treatment began was only $\frac{1}{60}$ came up to $\frac{1}{6}$ within 3 months, and has remained so. Without glasses there is still a tendency to squint. He concludes from that and other cases that there is no doubt of the existence of amblyopia from disuse.

**“Amblyopia From Suppression, Congenital Imperfection Or Disuse
—Which Or All?”**

DR. LEARTUS CONNOR, DETROIT, MICH.

Since different writers use the term “amblyopia exanopsia” to express radically diverse ideas, it is needful to define its meaning in this discussion. Negatively it is not applied to the dullness of vision induced either by an organic lesion, which can be objectively seen with the ophthalmoscope or otherwise; nor by exclusion of light from the retina, in part or whole, during long periods, nor by defective refraction or disturbed muscular equilibrium of either ciliary, rectus or oblique muscles. Positively it is applied to that dullness of vision which attends the inability of the brain to recognize impressions sent in from the retina. As to the nature and the causes of the dulled vision, we have three widely differing views. The first contends that the brain actively inhibits the visual center from receiving impressions until it loses its receptive power in whole or in part; the second says that the brain or visual center was not properly constructed; while the third argues that the phenomena result from the simple disuse, like the disability induced in other organs by a cessation of much or all of their functional activity during a considerable period. The relative importance of these views is of a practical nature. If we adopt congenital imperfection, it matters little whether cases of squint with amblyopia are operated upon early or late; whether the refractive defects be corrected at once or at convenience, the visual results will be the same. If the suppression be accepted, then it were criminal to delay in the rectification of those causes which are believed to induce the loss of sight lest the inhibitory power of the brain continue to the production of absolute blindness. If the amblyopia be regarded as due from simple disuse, then surely every consideration prompts to an immediate restoration of the fullest functional activity. Ophthalmological literature affords abundant authority in support of either of these views and of the practice based thereupon. In this state of the question a discussion by experts is of more than passing moment, and to secure such discussion from this section is the object of this paper.”

After a consideration of all the points involved in this question, the author concludes:—

1. “There are undoubted cases of amblyopia from congenital imperfection; characterized by central scotoma, and unaffected by

any treatment; they are found in eyes that squint and eyes that do not squint, in the hyperopic, astigmatic, the anisometric and in eyes free from one or more of these defects.

2. There is no positive evidence of the existence of amblyopia from suppression, viz, a loss of sight from the inhibitory action of the brain upon the visual center.

3. There is a class of cases often confounded with amblyopia characterized by lack of persistent vision rather than absolute loss; by the absence of scotoma; improved often by proper management; never congenital; found in all varieties of refraction and all sorts of muscular disturbance; having the same nature as diminished functional power of any sound organ from non-use or diminished use.

4. There is a class of cases in which a congenital amblyopia is still further crippled by disuse; in these proper management often produces satisfactory results in removing the latter factor.

5. It therefore remains good practice to study every case of amblyopia with or without squint at the earliest possible moment; correct its refractive defects and restore its muscular equilibrium because while we cannot repair the congenital imperfection we may remove the disability from disuse, and thus secure some improvement of vision.

Discussion.—Dr. Starkey exhibited a number of charts containing the history of patients he had treated all of which tended to show that amblyopia from disuse did exist and was often at least partially cured by bringing the eye again into the condition to work.

Dr. Thomas reported a case in which he had examined the eyes of a very intelligent child with perfect vision, had seen the same child some time later with a squint and developing amblyopia, and later still, after surgical treatment, the eyes had recovered perfect vision.

Dr. Johnson and Dr. Risley each referred to cases which they had published heretofore.

“Report of the Examination of the School Children’s Eyes in the City of Minneapolis.”

DR. FRANK ALLPORT, MINNEAPOLIS MINNESOTA.

Dr. Allport reports some of the results obtained by the application of the plan of examination proposed by him more than two years ago and described the plan again, together with a few improvements that have suggested themselves from the practical use of the method. He has also recently adapted almost the same plan in the examination

of motor-men on street cars and engineers and firemen on railroads, modifying it of course to suit the special work done by these people. He has found in his city a considerable number of such employees unfit for their position and not only unsafe for the company to employ but a menace to the public safety.

Vicious Reading Distance a Cause of Asthenopia.

DR. C. H. THOMAS, PHILADELPHIA.

J. J., a student aged 15, consulted Doctor Thomas October '96, wearing weak minus cylindrical lenses which gave vision of $\frac{5}{8}$ in each eye. No cause for change in the glasses could be found and no muscular error existed. The asthenopic symptoms however were very distressing and the boy was unable to keep up with his classes, having fallen two years behind those with whom he started. He did not suffer during vacation. It was found that he habitually held the book in reading at 7 inches, though he could read fine print easily at 13 to 15 inches. The 13 inch reading distance was strictly adopted and after one week the complete relief of the asthenopia was reported and this condition was continued.

"The Use of Full Correction Cylindrical Glasses in All Cases of Astigmatism."

DR. L. J. LAUTENBACH, PHILADELPHIA.

"I believe that the entire correction of the astigmatism present in every eye is a necessity, that is, provided the eye is used at all for near work. The refraction should be so adjusted that the ciliary muscle fibres act equally to produce a clear and distinct image upon the retina.

"Congenital Opacity of the Cornea."

DR. WENDELL REBER, PHILADELPHIA."

"The fact that within the last 160 years but few writers have alluded to congenital opacity of the cornea would indicate either that the anomaly is comparatively rare or that it is infrequently reported. It is estimated to occur once in every 2,500 cases of ocular disease." In the case that follows the child was delivered by forceps and the eyebrow and lids were injured in the operation. When the swelling disappeared and the eye could be examined the greater part of the cornea was occupied by a bluish-white opacity. For some months there was no change in the appearance of the opacity, but now it seems to be slowly clearing up. After considering other cases reported and the

conclusions of others the writer continues: "Admitting that there exists a class of congenital opacities of the cornea apparently the result of foetal keratitis the fact that the cornea is normally opaque well into the later months of pregnancy, acquiring its transparency only by degrees, seems to us to lend probability to the idea of arrested development. When embryologists have settled for us whether the cornea clears from center to periphery or from periphery to center we shall have made a long stride toward solving the etiology of this phenomenon."

"Congenital Opacities of the Cornea."

DR. H. MOULTON, FT. SMITH, ARK.

"My case was that of a boy 8 years old with total opacity of the left cornea, said by the parents to have been present since birth. They stated also that the opacity would sometimes clear up so that the outline of the pupil could be seen. There had been no inflammation about the eye at any time. The diameter of the cornea was less than that of its fellow. The other eye was myopic and amblyopic. There was thinning of the retina and choroid in the papillo-macular regions. There was no history of syphilis."

Embolism of the Central Artery of the Retina.

DR. C. F. CLARK, COLUMBUS, OHIO.

The author reports several cases and then considers at some length whether or not we are warranted in concluding that true cilio-retinal vessels were the means of preserving the integrity of the papillo-macular area of the retina. "In answer to this question it may seem interesting, and, in view of the claims that have been repeatedly made in favor of this theory it is certainly surprising to note that in not one instance has the existence of what has been classed as a cilio-retinal vessel been demonstrated ophthalmoscopically. In not one was anatomical evidence adduced to prove that such a vessel was present, and, while our four writers claimed the existence of a cilio-retinal vessel, three of these in the context made it apparent that they did not distinguish between the cilio-retinal vessel and a macular vessel of deep origin. In conclusion I would say that beneath the statement of the time-honored theory that in embolism of the central artery a so-called cilio-retinal vessel serves to preserve the papillo-macular area by virtue of its origin in the choroidal system we must write "*not proven.*"

The Technique of Retinoscopy.

DR. J. ELLIS JENNINGS, ST. LOUIS.

"The mirror which I use is plane, $2\frac{1}{2}$ cm. in diameter with a central aperture 3 mm. in diameter cut through the glass. The annoying reflections from margins of the sight hole are obviated by using a very thin piece of glass well blackened about the aperture. The mirror is set in a piece of metal 5 inches long and $1\frac{1}{4}$ inches wide and over this is fastened another piece of metal which when closed protects the mirror from dust, and when open is used as a handle on the principle of a lorgnette. Either the right or left eye may be placed opposite the central aperture by merely reversing the piece of metal in which the mirror is set. In my experience the most brilliant and satisfactory light is the Argand burner or the Welsbach. I place it above the head of the patient and just far enough back to leave the eyes in shadow. I always work at one metre's distance. Dr. Jennings then exhibited an instrument which he calls a skiascope and which has been described in the *American Journal of Ophthalmology*. It contains a complete series of lenses and is easily manipulated at one metre's distance from the patient.

Anomalies of the Retinal Pigment Epithelium and their Clinical Significance.

DR. H. GRADLE, CHICAGO.

The special object of this paper was to call attention to the frequent occurrence of the granular pigmented appearance in the fundus of children and young people suffering from severe asthenopia. The author did not consider the changes in the pigment epithelium to be the direct cause of the asthenopia, yet he was of the opinion that they bore some direct relationship to each other.

Observations with the Binocular Lens for the Examination of the Eye by Oblique Illumination.

DR. EDWARD JACKSON, PHILADELPHIA.

Dr. Jackson exhibited the binocular lens and demonstrated its use and the advantages it possessed over the ordinary lens in use for such examination.

Dr. Baker presented the following resolutions to the Society :

WHEREAS, many school children suffer from defective eyes, thus incapacitating them for the acquirement of a suitable education, and

WHEREAS, many street car drivers possess defective eyes and ears thus rendering them dangerous men for street car companies to employ and a menace to the public, and

WHEREAS, many locomotive engineers and firemen, possess defective eyes and ears, thus rendering them dangerous men for railroad companies to employ and a menace to the public, and

WHEREAS, the method of examining locomotive engineers and locomotive firemen by railroad employes, now generally in vogue, is totally inadequate and unsafe,

Therefore be it resolved that whenever the systematic examination of school children's eyes by skilled ophthalmic surgeons is not practicable the plan for the preliminary examination of school children's eyes by school principals, or other school authorities, is hereby indorsed and recommended by this section, and

Therefore be it resolved that in the opinion of this section companies operating street cars or other railroad systems should be required to submit their drivers, locomotive engineers and firemen to a scientific examination by reputable surgeons as to the condition of their vision, color sense and hearing and that such examinations should be made at intervals of not more than three years.

The two resolutions were considered separately, the first was adopted, and as there was some discussion over the wording of the second it was referred to a special committee consisting of Drs. Allport, Gifford and Clark, and this committee empowered to consider the subject and report at the next annual meeting.

THE EYESIGHT OF SCHOOL CHILDREN.

The environment of school children, with regard to its influence upon their eyes, must be carefully studied. In the structure of the school buildings, as few obstacles to vision as may be should be permitted; ample illumination, whether natural or artificial, should be had from the left side of the desks, the desks themselves should be of such sizes as to permit the pupils' feet to rest firmly upon the floor; they should be provided with comfortable backs and slightly slanting tops, the latter placed at such distances from the eyes as to render sight easy without the close approximation of books; the blackboards, maps, etc., should be so situated as to be readily seen; an erect style of handwriting, less irksome to the eye than slanting characters, should be taught; and frequent changes of study or intervals of intermission should be secured, so as to avoid the harmful effects of continuous work of one kind. —From "Defective Eyesight in American Children," by Dr. FRANK ALLPORT, in *June Review of Reviews*.

THE OPHTHALMIC RECORD

A Monthly Review of the Progress of Ophthalmology.

VOL. VI.

CHICAGO, AUGUST, 1897.

NO. 8, NEW SERIES.

ORIGINAL ARTICLES.

GLIOMA OF THE RETINA.

By S. E. COOK, M. D.,

of Lincoln, Neb.

ILLUSTRATED.

Within the past two years it has been my fortune to examine a number of these tumors histologically, and I shall dwell especially upon their microscopical features in this paper.

Greef of Berlin has recently treated this subject very ably and completely in the *Deutsche Med. Wochenschrift*, obtaining his results by the use of the Golgi and Cajal methods of staining. This necessitates a special treatment of the fresh tissue, and the technical difficulties and capriciousness of the method are very considerable in the case of pathological tissues. I have used only the ordinary staining by logwood and eosin. The following case is so typical in its structure, besides possessing several features peculiar to itself, that I shall use it as a basis. The tumor was congenital, and the eyeball was enucleated when the child was six months old. The globe was enormously enlarged in all its dimensions, measuring $1\frac{1}{16}$ in. in its greatest diameter. The whole ciliary zone was staphylomatous. On section, the vitreous chamber was nearly half filled by an almond-shaped semi-solid growth, measuring $\frac{7}{8}$ inch antero-posteriorly, by $\frac{1}{2}$ inch transversely. The shrunken and degenerated vitreous incompletely filled the remainder of the chamber. The sclera was extremely thin. The flat and degenerated lens was pushed forward against the cornea, almost entirely obliterating the aqueous chamber, which still held only the wasted remnants of the iris. The optic nerve was shrunken to a mere fibrous cord. The tumor was well defined, but unsupplied with a proper enveloping membrane. It cut with difficulty, and con-

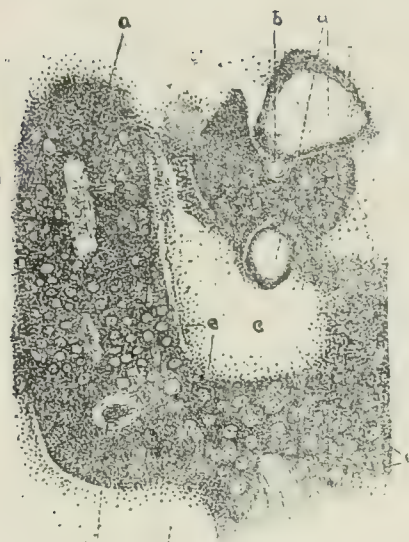


Fig. 1.—Cylinders of cells surrounding vessels. *a*. Longitudinal section of vessels. *b*. Cross section of vessels. *c*. Areas of degenerated cells. *d*. Deposits of lime. *e*. Whorls of cells, forming crypt-like structures. $\times 112$.



Fig. 2.—Whorls of epithelium-like cells. *a*. Large whorls. *b*. Small whorls. *c*. Area of degenerated cells. *d*. Deposit of lime. *e*. Cross section of vessel filled with cells $\times 600$.

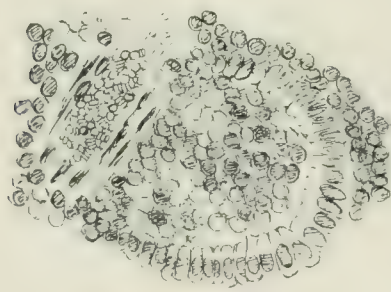


Fig. 3.

Fig. 3.—Large whorl with blood vessel.

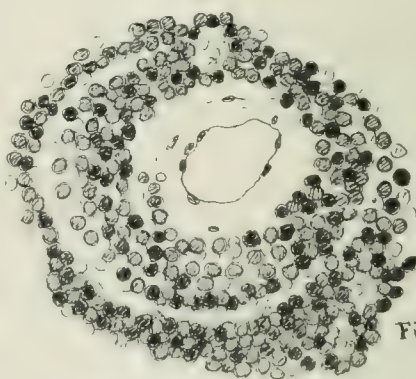


Fig. 4.

Fig. 4.—Cross section of vessel with thickened and degenerated walls.

tained, well distributed throughout its tissues, but more concentrated towards its center, myriads of granules of lime.

Microscopically, the tumor is exceedingly well supplied with blood vessels, interlacing with each other in all directions. The walls of many vessels are thickened and in a state of hyaline degeneration (Fig. 4). Each individual vessel is surrounded by a cylindrical mass of closely pressed, single nucleated, living cells (Figs. 1, *a* and *b*). The cell nuclei stain highly with haematoxylin and fill the cell bodies

almost completely. A very small amount of finely granular inter-cellular substance is visible, with here and there finely fibred bands of

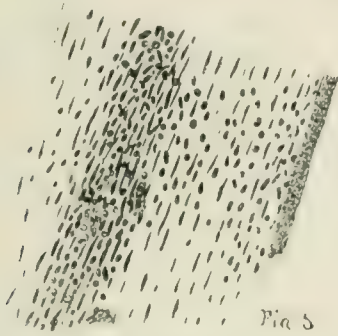


Fig. 5.—Cornea infiltrated with round cells.

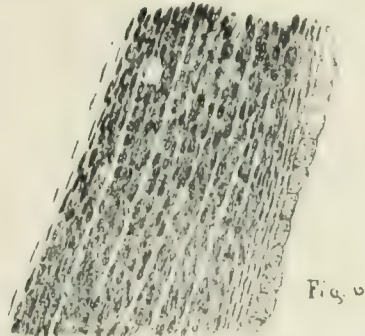


Fig. 6. — Choroid infiltrated with elongated cells.
x 600.

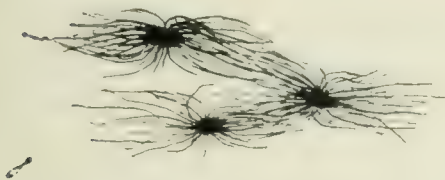


Fig. 7.—Neuroglia cells, also called Deiters' or spider cells.
(after Greef.)

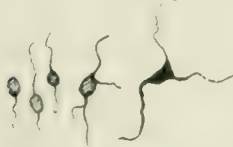


Fig. 9 —Small nerve cells.
(after Greef.)

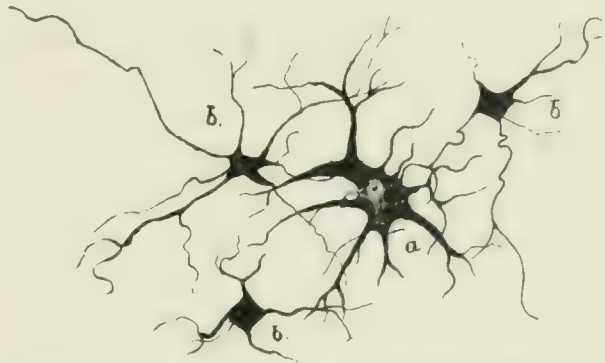


Fig. 8 —Ganglion cells. *a*. Giant ganglion cell. *b* Medium-sized ganglion cells.
(modified after Greef.)

connective tissue. Outside of the cylinders of living cells, and filling in the interstices of the growth, are immense masses of degenerated cells (Fig. 1, *c*), which stain feebly or not at all. Numerous deposits of lime, (Figs. 1 and 2, *d*), well defined, and often showing the cell formation, are interspersed throughout the growth. They are in no definite relation with the vessels, and sometimes almost encroach upon the vessel wall itself (Fig. 1, *d*). Occasionally small hemorrhages are seen. Two classes of cells are distinguishable in the tumor, viz., round cells, with a scanty amount of protoplasm, and resembling the cells of the nuclear layers of the retina, composing the bulk of the tumor, and elongated cells arranged in whorls (Fig. 2, *a* and *b*, also Fig. 3), resembling the corolla of an ox-eye daisy. In some portions of the tumor these whorls are very numerous (Fig. 1, *e*), while in other parts they seem to be

wholly lacking. At one point a thin-walled vessel is seen to be completely filled with the tumor cells (Fig. 2, *e*), furnishing an illustration of the manner in which extension to distant organs may occur. The tumor has appropriated to itself almost the entire retina, as only a small and almost unrecognizable fragment of it can be discerned. The choroid is wasted and infiltrated, in places, with closely pressed and flattened cells (Fig. 6). This shows how the tumor extends by contiguity. Here the cells are not arranged in whorls.

In regard to its cell forms, glioma of the retina resembles glioma of the brain. It differs from the latter, however, and indeed from all other tumor formations, in the peculiar arrangement of its cells. If the tumor be not too advanced and is still intra-ocular, and the vessels be not too numerous, the living cells are arranged in a cylinder or zone around each individual vessel. Filling in the remainder of the tumor, are masses of degenerated cells. The line of demarkation, separating the two cell areas, is sharp and pronounced. This arrangement of cells has been described, but only as an exception and not as the rule, and has given rise to the name of cylindro-glioma or angio-glioma. Wintersteiner, who has examined many cases, considers this arrangement as the rule, in cases at all advanced in development. In fifteen cases examined by Greef this structure was found more or less constant. In all the cases I have seen the living cells were grouped in cylinders around the vessels.

It is probable that this peculiar structure is entirely the result of increased intra-ocular tension. The cells are embryonic in character and multiply rapidly, but are of a very low order of vitality, and die easily when subjected to unfit conditions. When the tension in the eye-ball becomes increased, as it always does in cases at all advanced, the cells at a distance from the vessels are insufficiently nourished and degenerate and die. Greef found this arrangement of cells constant in tumors the size of cherry stones. In all cases, however, which had burst through the sclera, the extra-ocular growth ceased to show this characteristic cylindrical formation, but resembled precisely glioma of the brain. As long as the tumor is confined to the eye-ball, its growth is slow and its nourishment difficult. As soon, however, as it has burst through its ocular prison walls, there ceases to be interference with its nourishment; the growth, which heretofore was slow, rapidly increases; the formation of new vessels becomes accelerated; the cell degeneration almost ceases; and the tumor assumes all the characters of unflinching malignancy. In its finer build, retinal glioma corresponds,

in general, with glioma of the brain. By teasing fresh specimens, Leber found the protoplasm of the cells running out into numerous fine interlacing processes, resembling and analogous to Deiters' cells, found in glioma of the brain. Vetch also found these cell forms quite often, according to the freshness of the specimens. In regard to the peculiar whorl-like structures (Fig. 2, *a* and *b*), which I do not think are present in all cases, Becker described them in Graefe's *Archives* a few years ago, as also did Van Duyse, who designated such tumors as tubular glio-angio-sarcoma of the retina. They resemble cross sections of tubules lined with epithelium. They are not tubular however, but appear to form closed crypts. They may be connected with proliferation of the lymph sheaths surrounding the vessels, which, Van Duyse believes occurs in glioma. According to Greef, the mass of a glioma tumor consists of neuroglia or spider cells (Fig. 7), crowded together in great nests and bunches. Imprisoned and embedded in these nests, are giant and medium-sized ganglion cells, all with numerous branching processes (Fig. 8), and small nerve cells, with one, two or more processes (Fig. 9). These latter differ in form and size, and many intermediate and apparently transition forms are seen. He thinks these small and simple nerve cells are embryonic forms of the large ganglion cells. The spider cells also resemble the embryonic forms of neuroglia cells.

Cohnheim's theory as to the ultimate cause of new growths, would seem to have relevance here. He believed that there is an abnormality or irregularity in the embryonic rudiments of the part of the body in question—in short, that neoplasms originate from the growth of embryonic germs, or germinal cells, which have been, as it were, shut up in the normal tissues. In many individuals these tumor germs never become developed, but in others, through traumatism, mechanical and chemical irritation, etc., producing increased blood supply, and perhaps with diminished powers of resistance possessed by the surrounding normal parts, they become aroused to activity. According to the researches of Cajal and others, it is not infrequent to find in the normal retina misplaced cells, i. e., cells occurring in one locality which morphologically belong to another, as when cells belonging to the ganglionic layer are found in one of the granular layers. As a rule, these malpositions are without significance, but if aroused to activity, may produce a neoplasm.

Glioma is considered, by most pathologists, to originate in one of the granular layers, though usually in the inner one. It has been

found springing from the nerve fibre and ganglion layers as well, however. Indeed, if the tumor arise from the connective tissue framework, as is generally considered, there appears to be no essential reason why it should not find its origin in any layer of the retina.

Glioma is a growth peculiar to the central nervous system, and received its name from Virchow, who considered it to be the result of proliferation of the neuroglia cells of its delicate sustentacular framework. It is the only neoplasm occurring in the retina. It is much more frequently found in the brain, and occasionally occurs in the spinal cord and optic nerve. Retinal glioma is essentially a tumor of infancy and early childhood, and may be congenital. It practically never occurs later than the twelfth year, and indeed is very rare after the fifth year. It is occasionally double. Several children in the same family are sometimes affected. Fuchs saw two children in one family who died from the disease, while the third child had a congenital coloboma of the iris and choroid. He thinks that congenital failure of development may be an underlying cause.

The exact place glioma of the retina should occupy among the tumors, has been the subject of much discussion among scientists. Virchow believes the tumor to be akin to glioma of the brain, and has given it the name *glioma retinae*. He found many mixed forms in which sarcomatous elements were more or less frequent. To these he gave the name of *glio-sarcoma*. Ziegler, Rindfleisch, Delafield and Leber hold the tumor to be a small-celled sarcoma, and deny it a place among the true gliomata; Schöbl calls it a *cylindro-glioma* from its peculiar formation; Wintersteiner thinks it to be a *neuro-epithelioma* from its embryological descent; while Greef contends that it is a true glioma, holding in its meshes so many nerve elements, that it should be called *neuro-glioma ganglionare*. It seems to me that a proper regard for the embryonic origin of the tissues from which it springs, and the characters of which it assumes, would place this tumor in closer relationship with the carcinomata than with the sarcomata. The neuroglia is not true connective tissue, but is derived from the epiblast, and therefore tumors which partake of its embryonal characters are in their nature epiblastic. The epithelium of the skin is also of epiblastic origin, and has, as its type among the tumors, epithelioma. On the other hand, sarcoma arises from some structure of mesoblastic origin, and is built after the type of embryonal connective tissue, a product of the mesoblast.

The early recognition of glioma of the retina is a matter of vital

importance. In common with other intraocular malignant growths, it passes through three, and perhaps four, stages. In the first stage there are no inflammatory symptoms, although the eye becomes blind very early. The first objective symptom is usually the golden yellowish reflex, emanating from the pupil, sometimes noticeable at a distance, and even in the dark, which in pre-ophthalmoscopic times caused Beer to give the affection the name of "amaurotic cat's-eye." In this stage there are no subjective symptoms excepting blindness. As the growth slowly progresses it causes an increase in the intraocular tension, and the second or glaucomatous stage begins. Inflammatory symptoms and pain now supervene. This is the stage in which the physician usually first sees the case. As the growth increases, it creeps backward along the optic nerve, or bursts through the sclera forward, and the stage of extra-ocular growth begins. The tumor has now filled the whole globe, the sclera being partially softened and destroyed, and the tumor, being no longer confined by rigid anatomical boundaries, takes on renewed vitality, rapidly increases in size, and soon fills the whole orbit. It pushes forward the lids, and presents itself as an ulcerated, loathsome, painful, bleeding mass—fungous haematodes. It finally attacks the surrounding soft parts and bones of the face, or may follow the track of the optic nerve to the brain. Death, by exhaustion, or through implication of the brain, or by metastasis to other organs, is the final result. From its very inception the duration of the disease may be several years.

The only treatment is the earliest possible removal of the eye, being careful to remove as much of the optic nerve as possible. To be effective, enucleation must be done before the tumor has transgressed the confines of the globe.

BIBLIOGRAPHY.

- Leber: *Handbuch der Augenheilk.*, G. & S., V.
Vetsch: *Archiv. f. Augenheilk.*, XI.
Virchow: *Krankhaften Geschwülste*, II., 1865.
Gama Pinto: *Untersuchen über intraoculare Tumoren*, 1886.
Schöbl: *Centralbl. f. Augenheilk.*, XVII.
A. Becker: *Archiv. f. Ophthalmol.*, XXXIX.
B. Wolf: *Inaugural Dissertation*, Berlin, 1893.
Van Duyse: *Archives d' Ophtalmologie*, XIV.
Fuchs: *Textbook of Ophthalmology*, 1892.
v. Graefe: *Archiv. f. Ophthalmologie*, XII.

- Schweigger : Archiv. f. Ophthalmologie, VI.
 Knapp : Die intraocularen Geschwülste, 1868.
 Hirschberg : Der Markschwamm der Netzhaut, 1869.
 Rindfleisch : Zehender's Klin. Monatsbl. f. a., 1863.
 Ziegler : Lehrbuch d. pathol. Anat.
 Wintersteiner : Wiener Klin. Wochenschr., 1894.
 Hirschberg : Archiv. f. Ophthal., XIV.
 Iwanoff : " " " XV.
 Lemke : Archiv. f. Klin. Chirurgie, XXVI.
 Rompe : Inaugural-Dissertation, Göttingen.
 Ramon y Cajal : Die Retina der Wirbelfnien, 1894.
 Alt : Lectures on the Human Eye, 1884.
 Delafield ; Pathological Anat. and Histology, 1892.
 Flexner : John Hopkins Hospital Bulletin, 1891.
 Kallius : Anatomische Hefte von Merkel und Bornat, III.
 Bach und Hosch : Archiv. f. Ophthalmol., XLI.
 Greef : Archiv. f. Augenheilkunde, XXIX.
 Greef : Deutsche Med. Wochenschrift, No. 21, 1896.

IS THERE EVER A SEROUS IRITIS WITHOUT AN INVOLVEMENT OF THE CILIARY BODY, OR CHOROID, OR BOTH?

By WILLIAM CHEATHAM, M. D.

Louisville, Kentucky.

My object in presenting this subject is to call attention to one of the many defects in our nomenclature of diseases of the eye, and have some suggestions made as to their correction.

I have never seen a case of Iritis Serosa myself without an involvement of both the ciliary body and the choroid with hyalitis, any one of these latter complications being as serious, or more so, as the involvement of the iris, from which the disease gets its name. My attention was first called to this subject in my examination of one of our students; the book he was using as a text book, in giving the complications spoken of, with the involvement of other tissues, the latter seemed to him to be of more consequence than the pathological condition observed in the iris. Only a few days ago a young man came to me complaining of gradual loss of vision of left eye for three weeks; V. R. E. $\frac{2}{3}$; V. L. E. $\frac{2}{3}$; no improvement by glasses. His iris was discolored, pupil sluggish, there was exudation on the posterior surface of the cornea,—a perfect picture of what the books call serous iritis. I

looked at the eye with the ophthalmoscope and his vitreous was so full of floating bodies, that I could get no view of the fundus. Such cases I can give by the score. After this young man's vitreous clears up I am sure I will discover spots of choroidal inflammation, and if central, the result will of course be serious. I again say I never saw a case of this affection but what we had an involvement of the whole of the uveal tract; why then call it serous iritis, when the name expresses really a minor part of the trouble?

Let us see what some of our leading authors say of this disease: Noyes, page 307: Iritis serosa was formerly called Descemitis, aquo-capsulitis, etc. Dr. Noyes on this page gives us the usual symptoms of this affection, and refers to a case in which Dr. Knies held an autopsy in 1879, and found that the whole uveal tract was involved as well as the sheath of the optic nerve up to the chiasm. The optic nerve was inflamed for a small area around the papilla. The deep part of the vitreous was liquified and detached; its anterior part permeated by granular cells and membranes. The disease, therefore, must be generalized as much more than iritis, and might perhaps be called, "Uveitis Serosa." Why then call it a serous iritis?

Juler, page 163, says: If the pathology of this disease as given by Treacher Collins is correct, "and there appears no reason to doubt it, this affection cannot any longer be considered an iritis, *per se*, but a primary catarrhal cyclitis, or as Priestly Smith suggests a serous cyclitis." I am sure he can truly add choroiditis to the iritis and cyclitis; on the same page Jules says, since cyclitis is an invariable accompaniment of this affection, etc.

Berry, page 135, says: This variety of iritis, which receives its name on account of the exudation being on the whole more serous than fibrinous, is almost invariably associated with a cyclitis or a choroiditis. He also refers on page 137 to involvement of the papilla and vitreous. On the same page he says—"The etiology of serous iritis, or more correctly serous irido-cyclitis, etc."

With an involvement, then, of the ciliary body, choroid and vitreous, and sometimes the retina, optic nerve and its sheath, as admitted by all the leading authors on diseases of the eye, why do they call the disease Serous Iritis?

Other parts of our nomenclature are, I am sure, as defective, which indicates to me the importance of a revision. Some gentlemen may think that they have seen cases of serous iritis, *per se*, but I believe if more careful examination for involvement of the ciliary body

and the choroid be made, they will conclude as I have that the disease is an involvement of the whole of the uveal tract, or as Noyes says, a "Serous Uveitis," or even more; possibly with involvement in all cases of the vitreous, and in a majority of them of the retina and the optic papilla.

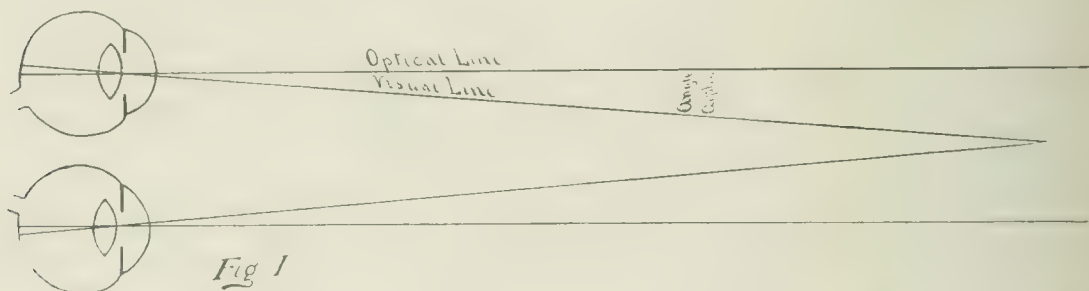
THE RELATION OF MALPOSITIONS OF THE MACULA LUTEA TO HETEROPHORIA.*

By G. MELVILLE BLACK, M. D.

Denver.

ILLUSTRATED.

The visual axis of the eye is an imaginary line drawn from the macula, the point of central vision, through the nodal point of the lens, passing through the cornea a little to the nasal side of its center. The optical axis is a line drawn from the posterior center of the sclera through the center of the cornea. Project these imaginary lines forward from each eye and the visual lines will converge and cross in infinity. The optical lines will run parallel to each other. There will be two angles formed between the two visual and optical axial lines with their apices at the nodal points of each eye; these are known as the angles *alpha*.



Landolt long since pointed out that the angle *alpha* differs in its size in different eyes. In high myopia the angle may be almost if not quite nil. In high degrees of hypermetropia it is greatly enlarged. This enlargement of the angle *alpha* is due to the situation of the macula. The macula is nearer the optic nerve in cases of high myopia, and further away from it in cases of great hypermetropia.

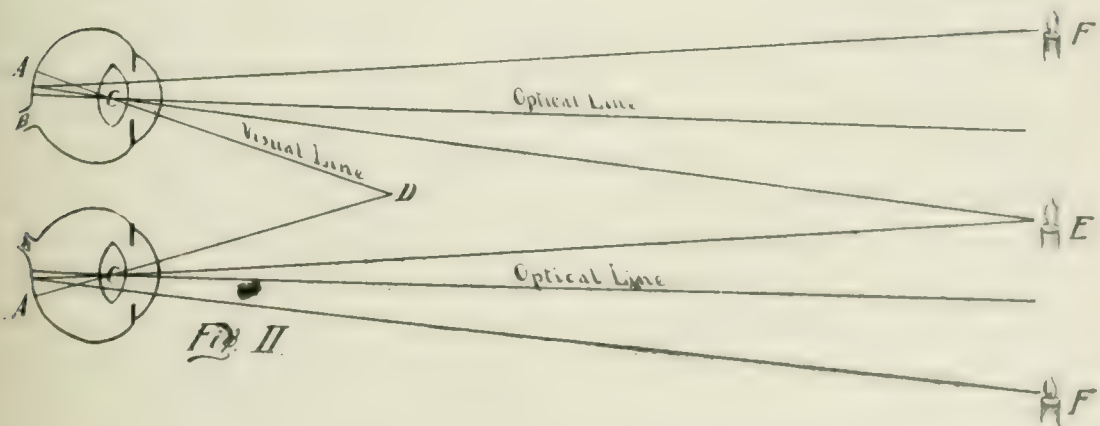
These are interesting facts upon which I propose to base the argument advanced in this paper.

It is my purpose to point out the relation between diminished and increased angles *alpha* and heterophoria.

When testing for a refractive error, I have frequently suspected from apparent divergence a high degree of exophoria. To my surprise when I came to examine the muscles, I found esophoria. I have found in these cases of apparent divergence with esophoria, that the angle *alpha* was enlarged. In many of these cases there was little or no error of refraction, showing that nature does not always observe the same exactness in placing the macula in the same relative position in all eyes.

We have been taught to explain muscular abnormalities by two theories. The one having the precedent by reason of age is that of insufficiency, or weakness of the muscles, on the side opposite that toward which the eye turns. It is presumed that the weakness may be due to insufficient nerve supply, or to intrinsic muscular defects. The other theory is that the eye when formed was not given a set of muscles which, when relaxed, would hold the globe in such a relative position to its fellow that both optical axes would be parallel, and the visual axes converge at an infinite distance; instead, one or more muscles were too short and their opponents too long; hence, during complete muscular relaxation the globe would be turned in the direction of the short muscle, or muscles. Such turning constitutes heterophoria.

I shall now attempt to show that heterophoria may be produced by a different cause than those mentioned; that of malposition of the macula lutea. If the macula is placed too close to the optic nerve or too far from it and the muscular adjustment is for an eye with the macula in its normal position, heterophoria must result if the muscles are completely relaxed.



The above diagram shows a condition in which the macula (A) is

situated too far from the optic nerve (B). A line drawn from the macula through the nodal point (C) meets its fellow but a short distance from the eyes (D). Rays of light coming from infinity (E) strike the retina between the optic nerve and the macula, and according to the laws of retinal projection, are projected outward, with resulting homonymous diplopia (F). To overcome this false adjustment the external recti muscles must turn the cornea outward thereby turning the macula inward until the rays of light coming from infinity (E) fall upon the macula. The eyes, in accordance with the law of binocular single vision, have acquired this habit of turning out until diplopia no longer exists. We have as a result apparent divergence, when our muscle tests will show esophoria, which should, according to our former teaching, be due to convergence. It has been my fortune to meet with a number of such cases. A few typical examples will be found further on.

When the maculæ are situated too close to the optic nerve there will be apparent convergence, when our muscular tests will show exophoria. Again the macula may be situated too high or too low giving the appearance of sursum vergens, or deorsum vergens, which our muscular tests will show to be hyperphoria, if there is malposition of the macula of one eye only. If both maculæ are situated too high or too low, there will be a tendency of the eyes upward or downward.

I do not mean to say that all cases of heterophoria are due to malpositions of the macula, any more than I would venture to assert that all cases are due to long and short muscles or deficient nerve supply.

I believe I am justified in using the term heterophoria as descriptive of this condition. The word heterophoria means a leaning to one side. Dr. Stevens, I believe, judges by the visual axes rather than by the optical axes or corneæ. If he judges heterophoria by the turning of the corneæ, or by the optical axes, then some new term will have to be coined when we take the visual axes as our standard. When testing the eyes for heterophoria with the Phorometer, we may have a turning out of the optical axes and corneæ and yet have esophoria because of an inward turning of the visual axes. As it is impossible for us to measure, with the Phorometer, anything except the position of the visual axes, it is fair to presume that Stevens did not err by taking the optical axes or corneæ as his standard.

It is possible to determine the relative position of the optical axes

and cornea by the Perimeter only; it is absolutely impossible with the Phorometer.

To determine the size of the angle *alpha* with the Perimeter, we place the patient in position before the Perimeter, cover one eye, and have him fix with the other a candle flame held a little above the center of the arc. The arc is turned in the horizontal meridian. A second candle is moved around the arc until the image of the candle is seen in the center of the cornea. The position of the second candle is read off in degrees by the scale on the arc, which represents the size of the angle *alpha* (the distance between the optical and visual axes.)

The angle Alpha when normal in size is about $3\frac{1}{2}^{\circ}$. In esophoria due to displacement of the macula the angle becomes larger, and in exophoria due to the same cause the angle Alpha becomes smaller, or completely coincident with the optical and visual lines, or the optical line may be situated to the nasal side of the visual line.

When displacement of the macula is suspected it is to be determined by the Perimeter, and it is by this instrument that I have been able to arrive at the positive conclusion that malpositions of the maculæ are responsible for many heterophoric cases.

Dr. Stevens has recently advanced a new theory, that esophoria and exophoria are due to too great upward rotation. His new instrument, the Tropometer, has been especially useful in determining the exact amount of rotation of the globe in all its directions. I am using the Tropometer daily in my office, and hope soon to publish my conclusions in regard to its general value. For the present, I am prepared to say that to explain all cases of esophoria and exophoria by too great *upward or downward* rotation must be fallacious, for neither will in any measure explain the esophoria and exophoria caused by malpositions of the macula, except where both maculæ are situated too high or too low.

As the above paper is already longer than intended, I shall publish only one case of malposition of the maculæ. It is the most interesting one in my collection.

J. R., Male, Age 40. Consulted me three years ago, complaining of eyes becoming easily fatigued both for far and near. Frequent supraorbital headaches. At times has great nervous exhaustion. I found at that time that his vision in each eye was $\frac{1}{8}$: improved to $\frac{1}{8}$ with + 0.50 cylinders axes 90. Muscular tests showed esophoria 9° with Phorometer. The esophoria was quite a surprise to me, for he

had apparent divergence. I at once examined him with the Perimeter and found his angle *alpha* to be 10° in each eye. I prescribed his cylindrical correction and told him to report in three months, as he lived some distance from Denver. He came in in about six months reporting no relief from the use of glasses, and that he got along better without them. Upon testing his muscles I found he had 10° esophoria. I prescribed 3° prisms, bases out, over each eye. He reported at the end of a month's time that he was no better. I now found he had 22° esophoria. I did a tenotomy of right internal rectus muscle leaving 3° esophoria which in a week's time increased to seven degrees. I then gave him 3° prisms, bases out, over each eye, and asked him to report in a month's time, which he did, when I found 14° esophoria, I now performed a tenotomy of the left internal rectus muscle. The immediate result of this operation was 2° exophoria which in few days time disappeared, orthophoria resulting. He now had a very apparent ocular divergence.

He returned home and wrote me some four months afterward, that he was having no more headaches, and that "his nerves were stronger," but that his eyes became tired easily upon use, and were sensitive to light, I advised him to return and found esophoria 7° , but as his divergence was quite marked, so much so that his friends called his attention to it, he did not want any more operative work done that would increase it. He found himself so much improved, as his eyes annoyed him but little, that he preferred to leave well enough alone. I examined him by the use of the Perimeter again and found the angles *alpha* to be 10° each. He was in the city a short time ago, and called upon me. I found he had esophoria 8° , but he still preferred to leave well enough alone.

It will be observed that by the two tenotomies performed 33° of latent esophoria was overcome, and that 8° still remain uncorrected. The small amount of esophoria encountered when the eyes were first examined, in comparison with the large amount that actually existed, is to be explained upon the supposition that the external recti muscles, by turning the visual lines outward, thereby turning the maculae inward to maintain binocular single vision, had acquired additional strength. The external recti had become so in the habit of doing this work that when the diplopia test was made but comparatively small amount of the existing error was revealed at a time, because the externi did not relax, and it was only by the use of the prisms, by which the externi were in a measure relieved, that a larger amount of

the esophoria became manifest. When this was corrected by tenotomy, and the externi thereby still more relieved, the error continued to become more manifest, until a second tenotomy was warranted. It may be classed as a case of latent esophoria, caused by the maculæ being situated too far from the optic nerves.

OINTMENT OF THE YELLOW OXIDE OF MERCURY.

By WM. D. BABCOCK, M. D.

Professor of Diseases of the Ear, Nose and Throat, Med. Dept. University Southern California, Los Angeles, California.

One of the most used and important ointments is that of yellow oxide of mercury. There is great trouble to keep it in good condition. As usually dispensed it soon decomposes; and to be sure of always having it good it must be made fresh every few days. The light decomposes it, and, in the form we usually get it, the mercury falls to the bottom of the menstrum used.

S. Holth in the *Archives of Ophthalmology*, October 1895, gives the results of his observations. He had a two per cent ointment of the yellow oxid made up with vaselin, lanolin, and cold cream, either alone or in combination. They were placed under various conditions, and after a five months observation it was found in every case in which the ointment was exposed to sunlight, or diffuse daylight in the common pots, and in glass pots; grayish or black discoloration followed in a shorter or longer period depending on the intensity of the light independent of whether the pots were provided with covers. But when preserved in the dark there was no change in the salve.

This rather long introduction to a short subject matter is to call attention to an old, and almost forgotten way of making up the ointment which I believe prevents decomposition, and also precipitation of the mercury. It is easier to apply, and its efficacy is not impaired but rather increased by the addition of unusual ingredients. These are graphite and oleum Theobromae.

R

English Graphite,	-	-	grains, 10.
Hydrarg oxid flav,	-	-	grains, 20 to 40.
Oleum Theobromae,	-	-	ounce, $\frac{1}{2}$.
Butry Antimony,	-	-	drops, 2.

Mix and make into pencils.

Instead of the butter of antimony any bland oil will do. When

properly made, and any good pharmacist can do it, it is very efficacious. The graphite in the ointment keeps the light away from the mercury, and prevents decomposition.

The graphite and the oil together will not let the mercury fall to the bottom of the mass.

In making the ointment, the mercury is rubbed up well with the antimony, the graphite is added gradually. The mortar is warmed, the oil of Theobromae, having been melted, is added gradually stirring all the time vigorously, and just before the mass begins to set it is poured into paper moulds that have been prepared. The best size of the moulds is about one and one-half inches long, and $\frac{3}{8}$ of an inch in diameter.

In applying the stick to the eyelids it is rubbed on lightly, and the eye being closed for about ten seconds the excess, if any, is rubbed off. If it is to be put into the eye a small piece is picked off, the heat of the fingers making it soft it is put in the eye between the ball and lower lid, or if a more thorough application is wanted, evert the upper lid and rub it on. In this form it is also a good application to any abrasion of the lips or nostrils.

THE COMBINATION OF CYLINDRICAL LENSES AND ITS OPTICAL EFFECT.

By DAVID KLETZKY,

Pueblo, Colorado.

The effect produced by combining two cylindrical lenses, either + with +, or + with —, is a matter of great importance to every ophthalmologist. The simplicity of combining cylinders with spheres to produce sphero-cylinders, or sphero-cylinders combined to produce cross cylinders, or two + cylinders axis parallel, to make a stronger cylinder, or a + and — cylinder axis parallel, to diminish the refractive power of a cylinder, is taught in every text book on refraction. And, so far as my knowledge goes, I never could find in any text book on this subject, any other method of combining cylindrical lenses than the method mentioned above.

I shall endeavor to prove in this paper that two cylindrical lenses, + and — of 2.25 D. focus, have a power to produce nine combinations of cross cylinders, beginning with 0.25 D. and increasing by 0.25 D. to 2.25 D.; and, also, two cylinders, both +, say of 1.50 D., have a power to produce numerous sphero-cylinders, i. e., we can take two cylinders, say of +1.50 D. each, and convert them into five sphero-

cylinders of different combinations, beginning with 0.25 D. and increasing by 0.25 D. in one meridian, and decreasing by 0.50 D. in the meridian at right angles. The same rule holds good of — cylinders.

A few examples will make the matter understood. Let us take two cylinders, one + and one —, both of 2.25 D., and place them in the trial frame, which is marked in degrees, setting both cylinders at axis 135° , you will find them to neutralize each other. Now revolving each cylinder, the + cylinder 5° to the vertical, and the — cylinder 5° to the horizontal, you will then produce —0.25 D., axis 180° , and +0.25 D., axis 90° . For each rotation of 5° there is an increase of 0.25 D. in both meridians. The effect of this phenomenon is such, that from point of neutralization of the two cylinders to the quadrant, by revolving one cylinder from axis 135° to axis 90° , and the other cylinder from 135° to axis 180° , the full refractive power of the + and — cylinder is produced, and each cylinder moves through an arc of 45° , and through this arc, the two cylinders neutralize each other by 0.25 D. for each 5° .

To find the number of combinations we can produce from the point of neutralization to the point of greatest refraction, the following rule can be adopted: Assuming that we move each cylinder 5° from point of neutralization, we divide thus, $45 \div 5 = 9$, giving nine combinations. To find the refractive power of the cylinders needed to produce —0.25 D. in one meridian and +0.25 D. at right angles by rotating each cylinder 5° from point of neutralization, we multiply $25 \times 9 = 2.25$.

So with two cylinders of 2.25 D. each, one + and the other —, and setting the cylinders axis to axis at 45° , then rotating the + cylinder 5° nearer to the vertical, and the — cylinder 5° nearer to the horizontal, we are enabled to formulate the following:

Revolving each cylinder	$5^\circ = -0.25$, axis 180° .	+0.25, axis 90°
“ “ “	$10^\circ = -0.50$, “ “	+0.50, “ “
“ “ “	$15^\circ = -0.75$, “ “	+0.75, “ “
“ “ “	$20^\circ = -1.00$, “ “	+1.00, “ “
“ “ “	$25^\circ = -1.25$, “ “	+1.25, “ “
“ “ “	$30^\circ = -1.50$, “ “	+1.50, “ “
“ “ “	$35^\circ = -1.75$, “ “	+1.75, “ “
“ “ “	$40^\circ = -2.00$, “ “	+2.00, “ “
“ “ “	$45^\circ = -2.25$, “ “	+2.25, “ “

The combination of two + and two — cylinders is almost on the same principle as the — and + combination. Both the arc of revolution for each cylinder is 15° less, i. e., we only have 30° of revolution for each cylinder, and therefore less combinations are produced. The reason for this is that, by placing two + or — cylinders of equal refractive power axis to axis, we produce one cylinder, and double the refractive power. And, by rotating the axis to assume an arc of 30° , no neutralization is produced, i. e., the same refractive power will be maintained as if they were axis to axis. The reason for this, I am now unable to explain. By revolving the axis of the cylinders from the 30° arc to a larger arc, sphero-cylinders are produced. The refractive power of the sphero-cylinder depends on the number of degrees through which the axes of the cylinders are revolved.

To find the number of sphero-cylindrical combinations we can produce by combining the two + or — cylinders of equal refractive power, we must first deduct the number of degrees that the cylinders maintain the same refractive power. This number is 15° for each cylinder, so neutralization begins from this point to the point where the axes cross at right angles. This makes a rotation for each cylinder of 30° , and here we get a simple sphere.

The same rule can be adopted to formulate the result of neutralization by two + or — cylinders as has been adopted for the cross cylindrical combinations, remembering that the arc of revolution is here 30° instead of 45° . (Formula) Assuming that we move each cylinder 5° from point of simple cylindrical refraction, we divide thus: $30 \div 5 = 6$, giving six combinations, five sphero-cylindrical combinations and one spherical when the axes of the cylinders are at right angles.

To find the refractive power of the cylinders needed to produce 0.25 D. in one meridian with a rotation of 5° of the axis of each cylinder, we will multiply $25 \times 6 = 150$. So with two cylinders of 1.50 D. each we are enabled to formulate table No. 2. Cylinders each of +1.50 D. we set one cylinder axis 75° and the other axis 105°

Revolve one to 70° ,	one to 110°	= +0.25 sph. combined +2.75 cyl.	90°
" " " 65° ,	" " 115°	= +0.50 " combined +2.25 "	90°
" " " 60° ,	" " 120°	= +0.75 " combined +1.75 "	90°
" " " 55° ,	" " 125°	= +1.00 " combined +1.25 "	90°
" " " 50° ,	" " 130°	= +1.25 " combined +0.75 "	90°
" " " 45° ,	" " 135°	= +1.50 spherical.	

The practical application of combining cylinders by this method is indisputable when an observer wishes to correct each meridian separately in ammetropia with the aid of the stenopaic slit. To make this method easily applicable, we can insert two cylinders, a + and —, in a small contrivance like Dr Risley's rotary prisms, and to this instrument attach a stenopaic slit which should revolve at any axis desired. The following refractive meridians can be produced with two cylinders, one + and the other minus, and with a rotation of 3° each.

Formula: $45 \div 3 = 15$ Beginning with a refractive meridian of 0.25 D. So $25 \times 15 = 3.75$ D.

Table 3, showing that with two cylinders of 3.75 D., one + and one —, having the cylinders arranged to revolve by turning a knob in the trial frame, and having a stenopaic slit in front, the following meridians are produced, + or —, in the same instrument :

3°	from vertical to horizontal	= 0.25 D.
6°	" " " "	= 0.50 "
9°	" " " "	= 0.75 "
12°	" " " "	= 1.00 "
15°	" " " "	= 1.25 "
18°	" " " "	= 1.50 "
21°	" " " "	= 1.75 "
24°	" " " "	= 2.00 "
27°	" " " "	= 2.25 "
30°	" " " "	= 2.50 "
33°	" " " "	= 2.75 "
36°	" " " "	= 3.00 "
39°	" " " "	= 3.25 "
42°	" " " "	= 3.50 "
45°	" " " "	= 3.75 "

DANGERS IN SLIGHT INJURIES TO THE CORNEA WHEN COMPLICATED WITH GRANULAR LIDS.

By J. W. HEUSTIS, M. D.

Of Dubuque, Iowa.

There can be no doubt in the mind of any one who has investigated the subject at all, that granular lids, or perhaps more properly speaking, granular conjunctivitis is much more prevalent in some sections of this country than in others. This is especially true of those

portions devoted to the cultivation of grain. The majority of the farmers from whom we derive a large share of our practice in this locality, and who devote their attention to the raising of grain, or grass for seed, are especially liable to this trouble. So much so, in fact, that it is my universal custom to pay particular attention to the lids in all examinations of this class of patients. Granular lids, I have found, to be the almost constant accompaniment of the threshing machine. The patients do not complain so much of the lids nor do they realize their danger until the eye has received some injury producing an abrasion of the cornea. This, in two or three days, causes so much pain and annoyance that the advice of their physician is sought. Some times a cure is quickly accomplished, but very often the eye goes on from bad to worse till he seeks the specialist, who is often put to his wits' end to know exactly what is best to do. It has been my fortune during the past few months, to see quite a number of such cases, and without entering into a minute description, I wish to draw attention to some of the salient features of each and the general outcome of the different modes of treatment used.

Case 1 —A farmer while threshing timothy grass received some of it in his eye, which becoming imbedded in the cornea remained there for several days. It was removed finally by the family physician, who then sent him to me. On examination, vision = 0, an abscess being present covering four-fifths of the cornea. Lids were trachomatous, showing chronic granular conjunctivitis. Recommended a Saemisch operation, which was performed. The entire cornea sloughed. A bad prognosis was given at the time of the operation, as the eye was hopelessly gone when first seen.

Case 2 —Farmer while threshing got a piece of timothy grass in his eye, which remained in for some time and was finally removed by his family physician, who sent him to me for treatment. Examination showed some vision and a small abscess of cornea, trachomatous lids and chronic granular conjunctivitis of both eyes. A Saemisch operation was performed with good results. He recovered sufficient vision with which to get around, and will undoubtedly be still further improved by an iridectomy later on.

Case 3.—Farmer—Keratitis with ulceration aggravated by dust. Keratitis recurrent, but the ulceration had lasted only a week or ten days. The ulcer was dirty looking. He had been treated by an irregular physician for some time before I saw him, without improvement. Examination showed trachomatous lids and scars from which granulations had been squeezed. Treatment was at once directed towards the lids, which were thoroughly scraped with the small hoes made for that purpose. Atropin instilled and in ten days the patient was discharged. A month later he was seen and reported constant improvement.

Case 4 —Farmer—Ulcer of the cornea with keratitis of a recurrent nature. Had been treated by an irregular physician, who put in "something that burned." In this case the treatment was also directed to the lids, which were trachomatous

and showed chronic granulation. After several scrapings, the eyes made rapid improvement. This patient remained under treatment ten days and then returned to his home. One month later he returned for examination, and the eye seemed to be as well as ever.

Case 5.—Carpenter—Injury to the eye from a splinter. Examination showed abscess of the cornea and trachomatous lids together with chronic conjunctivitis. The abscess was on the lower edge of the cornea and was surrounded by a band of ulceration extending some distance in every direction. The treatment in this case was the galvano-cautery, which, after several applications, stopped the ulceration and sloughing process, and the patient has retained a fair amount of vision.

These cases, taken at random from patients seen during the past few weeks, will serve to illustrate my point, viz.: the necessity of paying more and immediate attention to the lids whenever and wherever we find a granulated condition in connection with an injury to the cornea. There is, in this condition of affairs, always a discharge; sometimes more and sometimes less. Given therefore an abrasion of the cornea or in fact any condition where the epithelial layer has been removed, presenting a place for infection, which must of necessity, be constantly bathed in the secretion present, there can be but one possible result, viz.: infection, from which will result an abscess, sloughing and ultimate loss of the eye. In all such cases, the first and most important step is to look after the lids. Get these into good condition and, as a rule, under proper sanitary conditions and a rational treatment, the eye will recover, showing perhaps no more of the injury or ulceration than a small leucoma. Allow the lids to take care of themselves or stopping in fact at any measure, except the removal of the granulations, the chances of saving the eye are reduced to a minimum. It will be noticed in Case V., that the actual cautery was first applied. This was done because the case had already gone on to the formation of an abscess and a slough, but had not gone so far that the eye was despaired of, and urgent measures were demanded to stop the process as quickly as possible in the hope of saving what remained of the cornea. So much has been written on the treatment of granular lids, that it seems almost ridiculous to say anything more, but I wish to add my bit of evidence and testify to the good results obtained from scraping the lids, which method of treatment I prefer to all others. With a good scraper to remove all the granulations, and an actual cautery to stop the process in the cornea, we have two weapons with which to fight those most troublesome conditions, viz.: granular lids and abscess of the cornea.

REPORT OF TWO CASES OF FOREIGN BODIES IN THE EYE.

By WARWICK M. COWGILL, M. D.,

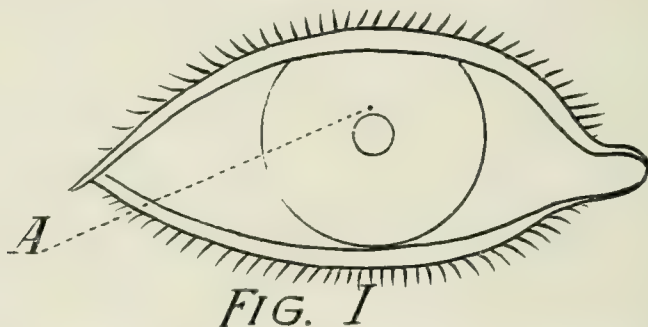
Paducah, Ky.

ILLUSTRATED.

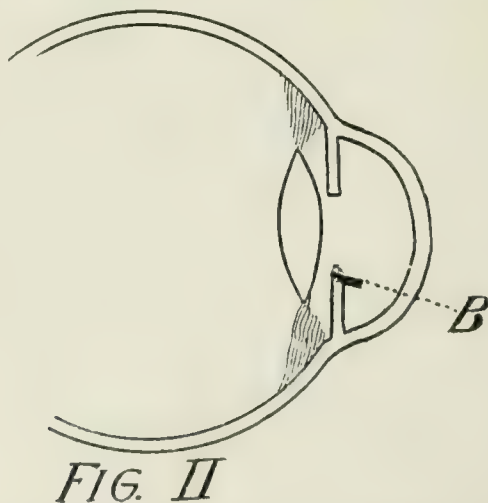
Cases of foreign bodies in the eye are of so common occurrence, that it is only those that possess some unique feature that are worthy of report.

The two following cases, I trust, possess sufficient of the unique to make them worth recording :

Case I—Mr. Gus. A. C—, aet 38. Two days before coming to me, while driving down an iron hoop on a barrel, was struck in the left eye by a flying bit of iron, measuring $\frac{1}{2}$ mm. x 2 mm. The iron passed through the cornea and trans-fixed the iris near its pupillary margin on the temporal side (Fig. 1), the free



end standing out into the anterior chamber, perpendicular to the plane of the iris. (Fig. 2.)



The foreign body did not pierce the lens, as I determined by its even movement consensuous with the movement of the iris in dilatation and contraction, remaining all the while in a position perpendicular to the iris.

The eye was slightly injected and the aqueous a little turbid. I will add also that the right eye was defective, owing to an extensive adherent leucoma of past

date. This fact added to the seriousness of the injury in the left eye and made the solicitude for saving it more intense.

The iron was so situated that should the aqueous escape, with it in its original position, it would be pressed backward into the lens, in which case the injury to the eye would be greatly increased and the extraction much complicated.

My plan of attack was, in doing the paracentesis, to pass the point of the keratome below the iron, and before the aqueous escaped to bring the blade up with a sweep and lay the foreign body flat on the iris. (Fig. 3.) This manœuvre I was fortunate enough to do suc-

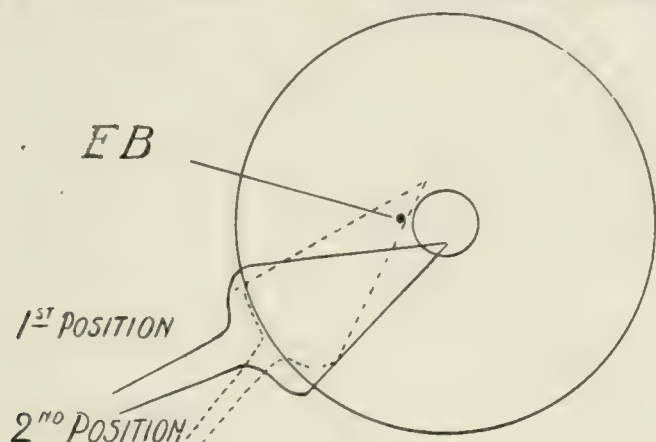


Fig. 3.

cessfully. Having the foreign body flat on the iris, with a pair of smooth-bladed forceps I removed the fragment of iron on the first attempt. The operation was done under cocain anesthesia, with bichlorid antiseptis.

The eye recovered perfectly without a trace of any injury having been done.

The patient was discharged on the eighth day, V., L. E. — 18, w + 2.25 D.

Case II —Mrs. J. T. H —, aet 34. Had been shot in the face and breast with a shot-gun loaded with squirrel shot some three or four days before I was called to see her, by Dr. P. H. Stewart, her attending physician.

The left eye was very much inflamed; chemosis; iritis; very tender on palpation; fundus cloudy from hemorrhage V. = 0. A glistening metallic spot (a shot) could be seen presenting through the iris into the anterior chamber at its lowest portion. She had been wounded in numerous places on face, neck and chest by the shot, but no sign of a wound could be seen on the eyeball or through the lid. Under chloroform narcosis, I attempted to remove the shot, but all efforts were futile. I enucleated the eye.

On examination the eyeball showed an opening where the shot had entered on the inner-posterior portion of the ball, one-fourth inch from the optic nerve entrance.

The shot had penetrated the orbit, struck the orbital wall and was deflected into the eye, passing through the eye from behind and presenting in the anterior chamber.

A REPORT OF THREE CASES

By JAS. W. DUNN, M. D.,

Cairo, Ill.

The following cases occurring in my practice present some interesting features :

Case I.—Miss N., a young unmarried lady, was sent to me about Nov. 1, 1896, by her brother-in-law, for the examination of an ocular trouble. I found the affection limited entirely to the right eye and consisting of a very slight protrusion of the ball and considerable lagophthalmus. The latter was due entirely to an elevated condition of the upper lid. The elevation amounted to about 5 mm., but the protrusion was scarcely discernible. There was no anatomical alteration in either lid as far as could be seen, and no history of trachoma, of any chronic inflammation, or any general trouble. The eye could be closed easily. Von Graef's sign was quite apparent, and the ball showed a slight tendency to roll up on the lower lid when the patient looked down. There was slight dryness of the conjunctiva; active pupil; no limitation of motion; no diplopia nor ametropia nor tachycardia. Her general health was good, better, according to her physician, than it had been for a number of years. She was, however, somewhat emotional and nervous, and her trouble was aggravated by any excitement, as an evening at the theatre or similar places.

Not being satisfied as to the diagnosis, we decided to treat the case tentatively for a while and await developments. She was given tonics and kept away from public places. This treatment was continued for about two months when her physician sent her to the eminent surgeon of the Marine Hospital here for his opinion. He advised strychnia, iodide of potassium and galvanic electricity. This treatment has been continued about five weeks.

I examined the case again the 10th inst. and found the eye symptoms unchanged except a lessening of the exophthalmos. Her physician, however, told me that he had noticed at times a slight pulsation in the carotid branches of the left side, but there was no tachycardia or enlargement of the thyroid gland. Putting this pulsation with the elevation of the upper lid and the slight protrusion of the eye I made the diagnosis of Basedow's Disease.

This seemed to be the most probable conclusion, though it is quite an obscure case and the symptoms somewhat irregular. It is not usual to see the ball protruded and the lid elevated before the other symptoms of exophthalmic goitre appear, and it is rare to see it limited to one side. The patient seems to be doing very well under tonic treatment and is gaining flesh.

Moran

Case II.—Chas. N., aet. 18, came to my office Oct. 15, 1896. The history of his trouble was very brief. He was standing over the window of a large flouring mill where he works. On closing his left eye to remove an accumulation of dust he suddenly became aware that he was blind in half of his right eye. He had nothing done for several days, but finally consulted his family physician, who sent

him to me. His condition was as follows: There was blindness in the upper field of the right eye extending from about 15° to 165° . The fixation point was untouched. The pupil was normal in size and activity; tension—1, and no pain. On examination with the ophthalmoscope and by electric light reflected from a head mirror (I found the latter method gave one the better view), I found a tumor occupying the lower half of the globe. The highest point was about the center of the eye measured from before back and from side to side with the eye directed straight ahead. Vertically, however, it reached only as high as the lower border of the disc. Carefully examined it appeared firm and nodular except down its anterior side which gave the appearance of detached retina. By having the patient look downward one could see over behind the growth to a certain extent and thus appreciate its rounded form. It was grey in appearance and slightly pinkish. Small blood vessels could be seen running irregularly over it in various directions. A diagnosis of sarcoma of the choroid with retinal detachment in front was made and an enucleation advised. The patient, however, was allowed, at his insistence, to go to Chicago for confirmation of diagnosis. He entered the State Hospital at that place where he was kept under observation and treatment for about two weeks. The treatment was of a specific nature and given to clear up the diagnosis. Finally the eye was removed and the diagnosis confirmed by a microscopical examination of the growth. The patient was thus saved from a serious danger by prompt surgery.

The interesting features of the case are the facts that the patient must have been blind in a large part of his eye for a long time before he knew it, that he was quite young, and that the tension was decidedly subnormal, von Graefe making the point that a normal or increased tension is one of the things that distinguishes detachment of the retina due to intra-ocular tumors, from a simple detachment.

Case III —T. J., son of a Kentucky farmer, was out shooting birds with a muzzle-loading shot-gun about Dec. 1, 1896. A piece of a percussion cap flew off and passed through the nasal limbus of the cornea of the right eye, tore through the iris behind and imbedded itself in the lens. He was taken to the family physician, who probed the wound carefully but could not find the piece of cap. He was treated for seven weeks with the hope that the eye would heal up, but the pain and inflammation gradually increasing all the while he was brought to this city for treatment and fell into my hands. I found the eye very painful, greatly swollen, and the anterior chamber filled with pus. The lids were œdematous and the conjunctiva so swollen that it was pressed out over the lower lid in a roll as large as a pencil. There was anterior synechia, the lens and iris were much disorganized, and the eye appeared to be in a state of panophthalmitis. The left eye presented symptoms of a dangerous character. In it were great photophobia, lachrymation, slight murkiness of humors, sluggishness of pupil, failure of accommodation, pain, and circumcorneal injection. The ophthalmoscope showed the disc and retina to be hyperæmic. I advised enucleation of the suppurating eye at once, but expressed the fear that the good eye had already gone too far. The operation being consented to, the wounded eye was removed and examined and the offending copper found in the remains of the lens. The wound healed nicely.

Atropine was instilled into the left eye and the patient kept in doors. In a week's time the operation wound had almost healed and the other apparently completely recovered.

The remarkable feature about the case to me was the ready subsidence of the sympathetic trouble after it had seemingly become well established.

A CASE OF EMBOLISM OF A BRANCH OF THE CENTRAL RETINAL ARTERY.

By J. HERBERT CLAIBORNE, M. D.,

New York.

ILLUSTRATED.

A stout, thick-necked Italian of 38 years of age stated that while reading a newspaper in a street car about twilight he suddenly noticed that his left eye began to run water. At the same time the print became blurred. On closing his right eye he found he could not see how to read with the left except with great difficulty.

His left eye had a normal look when he presented himself for treatment and the pupillary reflexes were good. In looking directly into my face with the left eye he said he could not see my eyes or nose; the rest of my face was clear. A superficial examination of the field shows a small scotoma which was not absolute except for a small spot in the center. On testing him with colors he said that a small red square in the center of a white card looked black and that the surrounding card looked green. A green square on a white card was then shown him, and he said the card was green but he could not see the green square at all. His vision was found to be $\frac{2}{40}$ under homatropin several days later, with a correction of 1.50 D. of hypermetropia.

The ophthalmoscope showed that the region of the macula was slightly hazy, as if there were a small amount of serous injection there. The optic nerve was normal. Just at the lower and outer border of the disc a small artery came off from the lower central artery and ran towards the macula after having pursued a short course downward and outward. Just before it reached the macula it bifurcated in a prong-shaped manner. It appeared slightly constricted just after leaving its parent branch, then got nodular, then constricted again, and finally swelled once more, until just before it forked the caliber appeared largest. There were no hemorrhages. Three weeks afterwards the field was taken with the perimeter and the scotoma was still found to be relative except directly in the center, where there was a small spot of absolute blindness. This undoubtedly accounted for the fact that the patient had been unable to see the red and green square on the white card. He persisted in saying that everything white appeared to be green to that eye.

The snow on the ground he described as looking a distinct green. The vision had fallen somewhat at this time and may be described as $\frac{2}{60}+$. There

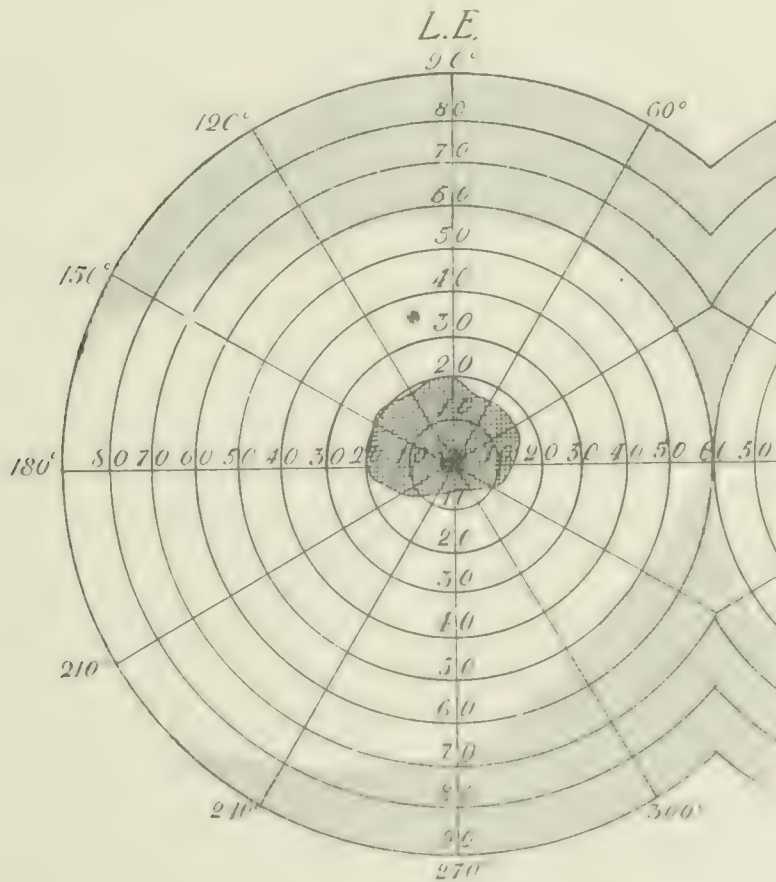
were no changes in the fundus except that the artery at its constricted points looked a trifle more thin and exsanguinated.

The patient was seen eight months later, when the field was found to be practically the same, with the relative scotoma and the small absolute one in the center. The optic disc was distinctly white to the outer side, suggesting the appearance of atrophy of the pupillo-macular fibres found in tobacco and alcoholic amblyopia. The artery was still exsanguinated and nodular at its origin from the parent branch, but appeared to be of a normal caliber toward the macula, near which it forked.

I could see no signs of anastomosis with cilio-retinal vessels.

The diagnosis in this case was not made without difficulty. By a superficial observer the constriction of the artery might have been easily overlooked. But it was present as I have described it, and this fact together with the physical characteristics of the man, the sudden onset of the blindness, the position of the scotoma in the field corresponding with the part of the retina supplied by the artery affected, made the diagnosis clear.

At times it happens that the circulation is restored in the part of the retina originally supplied by the plugged artery.



March 25th, 1890

Some authorities think that this is due to a re-establishment of the lumen of the arterial canal. This explanation is not entirely satisfactory in some cases. Dr. W. A. Holden has shown in the *Archives of Ophthalmology*, 1893, vol. 22, p. 90, that occasionally collateral circulation is established by anastomosis of the plugged artery. He has shown this by drawings of the fundus in several cases.

The accompanying cut shows the position of the scotoma in the case herein reported. The crossed lines show the relative scotoma and the black central spot the absolute. The position of the entire blur corresponds with the portion of the retina supplied by the plugged artery.

REMOVAL OF A PIECE OF STEEL FROM THE VITREOUS CHAMBER, THE POSITION OF THE FOREIGN BODY BEING DETERMINED BY THE PRESENCE OF A SCOTOMA IN THE FIELD OF VISION.*

By CHARLES A. OLIVER, A. M., M. D.,

One of the Attending Surgeons to the Wills' Eye Hospital; one of the Ophthalmic Surgeons to the Philadelphia Hospital, etc.

ILLUSTRATED.

T. W., a forty-three year old worker in a rolling mill at Tacony in this city reported at my clinic at Wills' Eye Hospital on the twenty-second of January of this year with the history of having been struck in the right eye by a steel-chipping the previous evening. He said that sixteen years previously he had had the same eye injured in a similar way whilst he was in India, but he felt sure that nothing had penetrated the organ, and that although he had always been slightly nearsighted, yet the sight of the two eyes had been alike until the second accident—since which time, vision was practically lost in the injured eye.

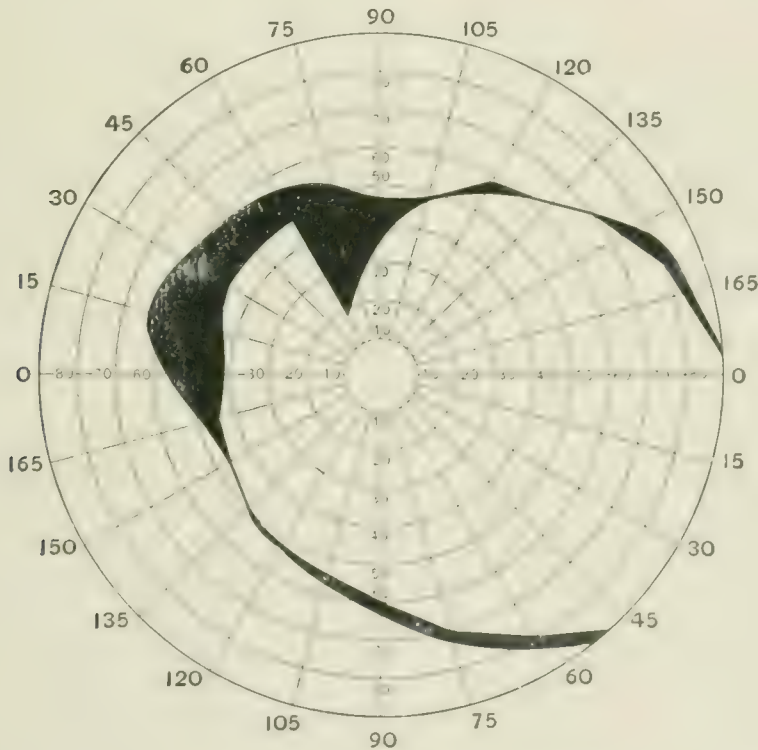
Examination of the affected organ showed both tarsal and ciliary congestion. There was an irregular perforating wound of about two millimeters in length in the upper part of the cornea reaching to the limbus. The entire corneal membrane appeared somewhat hazed. The iris was thickened and discolored, with a few almost imperceptible posterior synechiae along its pupillary margin. In the upper portion of the iris in a position corresponding with the break in the cornea there was a triangularly shaped wound in the iris-tissue. The pupil was irregularly round about three millimeters in its horizontal meridian and the iris was quite sluggish in action. The lens was apparently

* Read before the American Ophthalmological Society at the Fourth Triennial Congress of American Physicians and Surgeons, May, 1897.

uninjured. The patient complained of decided tenderness when the ciliary zone in the region of the injury was gently palpated. No red-reflex even after pupillary dilatation had been affected, could be obtained from the fundus, the vitreous chamber being filled with thick sheets of freshly extravasated blood.

With the exception of a few posterior synechiæ, a thickening of the iris-stroma, and a sluggishness of reaction to light (the marks of an old iritis as in the other eye), the left eye failed to show any abnormality; its corrected vision being equal to $\frac{5}{8}$ and its field being normal.

Vision with the affected eye which was obtained by my friend and Assistant Dr. Edmund Canby, was limited to light-perception. The field of vision as shown in the accompanying chart, revealed the presence of a sharply defined absolute defect in its upper inner periphery.



Upon consultation, I proposed in view of the situation of the defect in the field of vision, to attempt to remove the supposed foreign body with a heavily charged electrode through an opening made rather far back through the sclera between the insertions of the external and inferior recti muscles. After agreement with the patient, that should I fail, I should be privileged to try obtain a series of radiographs (to get which at the moment were impossible). I admitted him into

the Hospital wards, anesthetized him, and immediately proceeded to operation, with the result that the moment the magnetized electrode was brought to the wound-edge, the metal chip sprang out of the opening and attached itself to the electrode without the necessity of inserting the instrument into the eyeball at all. Not a drop of vitreous humor was lost.

There was not the slightest reaction and the after-treatment was uneventful. The vitreous extravasations, which were found not to be very dense, gradually disappeared without causing any apparent disturbance, whilst vision for form and color increased until it is now rapidly approaching that of the fellow-eye.

PASSAGE OF A SHOT THROUGH THE EYEBALL.

By J. P. WORRELL, M. D.

Terre Haute, Ind.

ILLUSTRATED.

The following case of gunshot injury of the eye presents some unusual features that seem to warrant its publication. The record of the case recalled at this late date, after all active processes have ceased and after the ultimate condition has been reached, adds value to the clinical history and serves to point a moral as to the value of statistics based upon cases, the records of which are published within a comparatively short time after the injury has been received and claiming to record "final results."

On Christmas day, 1881, W. S. aet. 14, while playing, was struck in the right eye by a shot from a toy pistol in the hands of a companion standing some twenty feet distant. The injury had been received twenty minutes before his visit to my office. The ammunition consisted of a mixture of No. 4 and 6 shot.

Right eye somewhat injected. Cornea presented a small perforating wound from before backward reaching the limbus in its outer and upper part. The direction of the wound in relation to the corneal surface was so oblique that a valve-shaped opening was made, owing to which there had been no escape of the aqueous humor. Anterior chamber of normal depth. The aqueous, though slightly stained with blood, permitted a clear view of the iris. Pupil of normal size and position. In the iris, corresponding to the position of the wound in the cornea, was a round hole, $1\frac{1}{2}$ mm. in diameter, the outer edge of which reached



I.

the ciliary border of the iris. (Figure I.) T.—? Projection for light good. No pain. The fundus could not be illuminated. It being possible that the shot might

have passed into the cellular tissue behind the ball and the determination of this fact having important bearing on the prognosis, I suspended the examination for the time, thinking that in that event evidence would soon be furnished in the appearance of hemorrhage from behind the ball. A bandage was therefore placed on the eye and the boy sent home.

After two hours I found a serous effusion distending the capsule of Tenon, being arrested in its forward progress by the attachment of the capsule to the eyeball. Directed instillation of atropia, compress bandage and confinement to bed.

December 26th. Passed a comfortable night. Ecchemosis and chemosis of subconjunctival tissue covering the inferior part of eyeball. No exophthalmos. Pupil irregularly and moderately dilated, that portion of iris in the neighborhood of the wound being swollen and encroaching on the otherwise round pupil. Faint reflex obtained from the fundus. A blood clot is seen lying against the upper and outer part of the posterior capsule. Diffuse opacity of vitreous. Counts fingers at 2'. On the third day eyeball slightly sensitive to pressure and some pain felt during movement of the eye; otherwise no discomfort. Pupil nearly round.

January 4, 1882. Eye continued to do well. No pain. Pupil almost uniformly dilated. Many large floating opacities in the vitreous, with their attachment in temporal region, float up and down with the movements of the eye. Says he can see my face very well, but the upper and right part (nasal field) is cut off.

Jan'y 10th. Progress uninterrupted. Counts fingers at 2'. Ecchemosis entirely disappeared. Sclera of lilac hue. Cornea under oblique light smoky. Anterior chamber deep. Pupil dilated symmetrically ad. maximum. No trace of wound in the iris. Lens clear. Fundus can be indistinctly seen, clearness of view diminishing as the temporal side is approached, where diffuse vitreous opacities prevent the recognition of any details. For objects, the nasal field is wanting up to near fixation point. Field, taken with candle, shows little or no limitation.

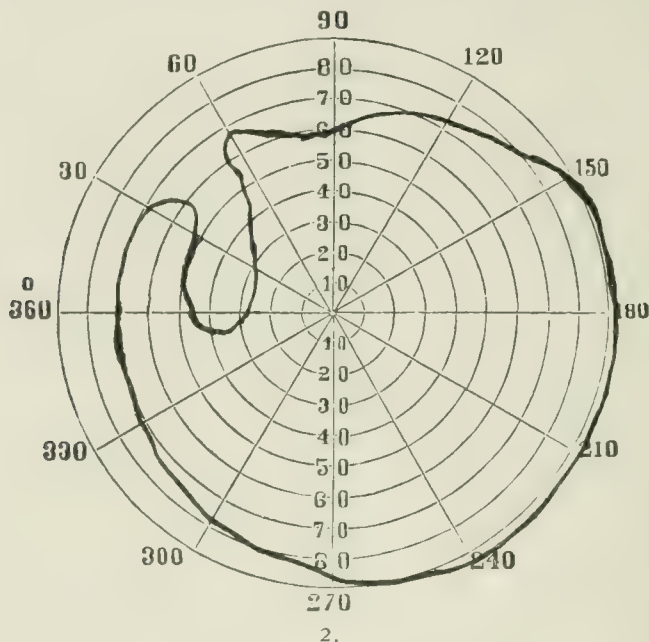
January 23rd. Diffuse opacities of the vitreous. The streamers stretching horizontally nasalward from the dense opacity of the temporal side persist. Between them, a view of the nasal side of the fundus up to and including two-thirds of the disc, can be seen and appears to be normal.

Feb'y 1st. Eye quiet. Sclera of a faint yellowish tint. Can obtain illumination of all parts of fundus. The transverse vitreous opacities much more attenuated. From a point above and to temporal side of macula a bright, greenish-white reflex, with sparkling points, observed. V. equals 15/L.

Feb'y 23rd. Atropia suspended ten days ago. Eye quiet. Sclera white. Cornea clear. Pupil normal in size and reaction. V.=15/XX?. Field taken with object shows slight diminution in upper nasal field.

May 1st. V.=15/XX? Eye quiet. Sclera white. Except in the temporal region, the vitreous had become comparatively clear, with small floating opacities and a few larger ones. The upper and superior segment of the posterior capsule is cut off by a greenish line, which appears to be the edge of a membrane running from before backward. Between this and the periphery of the lens the red reflex of the fundus is obtained. From the membrane backward and toward the macula run straight whitish, sharply defined bands, which unite at a point seen with a plus 5 D glass forming a crutch-shaped mass, from which radiate several other straight bands. Some of these are lost in the vitreous opacity of the temporal side, while others terminate by fringed ends in the clearer vitreous of the median region

Above this mass and between two of the bands is seen a patch of exposed sclera studded with masses of pigment. This is believed to mark the site of wound of exit. Field taken with white object showed a sharply defined tongue-shaped



defect in nasal side. (Figure 2.) The vision having apparently reached its maximum acuity and being entirely comfortable, no further record was made for a time, though the patient was occasionally seen. In the autumn of the same year he returned to school and passed from observation.

On January 27, 1883, he again appeared for examination and reported that he had recently observed a change in vision. He noticed circles of light floating from the temporal to the nasal side. Eye had never been red or uncomfortable. $V=10/C$. Field, when taken with object, showed extreme limitation in nasal side. Lens clear. Profuse vitreous opacities less, permitting a clearer view of the fundus, showing distinctly the atrophic area marking the wound of exit. The dense, sharply defined bands persist. Temporal region veiled by diffuse opacities. When the eye is turned to the extreme right, a red reflex is obtained from the equator. From a point between that and the atrophic area comes a greenish reflex and is believed to be due to a separation of the retina at that point.

Feb'y 22nd. There was observed for the first time upon the posterior capsule a flake-like deposit, with sharply defined borders. This opacity varied greatly in size and shape from day to day. By the middle of March the deposit covered the entire posterior capsule effectually preventing study of the fundus.

Having given an unfavorable prognosis, the patient ceased to attend regularly and no further record was made until Dec. 1st, 1883, when I was surprised to find upon examination that these flake-like opacities had quite disappeared; but in the posterior cortex minute granular opacities were to be seen. Periphery of lens clear. The condition of lens now permitted a view of the fundus, which, however, was somewhat veiled. From a point just external to the atrophic area the greenish reflex, believed to be due to a retinal detachment, was still seen. The

reflex from the equatorial region on the extreme temporal side was normal. Vision had fallen to 8/CC.

The record of the case here virtually terminated, though I find a field taken on April 13, 1885 with a candle as the object, which gave substantially a complete field, barring a large notch in the upper nasal quadrant. No other note.

In 1893, the patient being under care for correction of ametropia of the other eye, I found the right quiet, in a position of extreme external strabismus. T- -?. Pupil somewhat dilated. Lens opaque, chalky white. No tenderness; no perception of light

The above is an abstract of the very voluminous record of a case that at the time greatly interested me and in the final result of which I was greatly disappointed. The exceptional nature of the injury, the minimum damage done to the anterior portion of the eye and the escape of the foreign body from the ball, with but moderate amount of hemorrhage, made the case a comparatively simple one, which justified the hope that its termination might be the preservation of sight. This hopeful anticipation was strengthened by absence of all evidence of sepsis, the almost entire absence of inflammatory reaction, and the gradual clearing up of vision.

The prognosis of gunshot wounds of the eye is proverbially bad. Norris says, "The destruction at the point of entrance (and of exit if the shot pass through into the orbit) is so great, and the intra-ocular hemorrhage so large, that the eyesight is seriously impaired and usually irretrievably lost." A more hopeful view was entertained in this case on account of the exceptional freedom from injury of important structures. Barring the laceration of the vitreous and the injury to the coats of the eye at the point of exit, it appears from the subsequent history of the case that no injury was received, the result of which appeared as a factor in causing the final disorganization of the eye. We see the anterior chamber opened without loss of aqueous; the iris perforated without disturbance of its attachments; the ciliary region passed without involving the lens, or causing little if any injury to the ciliary body. All of these wounds healing without sequelae may be eliminated in our estimate of the relative responsibility of the various portions of the injured tract for the final result. There remain but the injury of the vitreous and that of the posterior coats of the eye. I think a study of the case will also eliminate the wound of exit, leaving the secondary changes taking place in the lymph and connective tissue masses in the vitreous to bear the entire responsibility.

The determination of the question as to whether a shot has passed through an eye or not has so important a bearing on the prognosis

that it is well to notice the light which was thrown on this case by the appearance of the effusion beneath the capsule of Tenon. I do not recollect having noticed any mention made of this, or of sub-conjunctival ecchymosis as an element in the diagnosis of passage of a shot through the ball into the orbit. While the determination of this fact in most cases will have no value in the prognosis in relation to preservation of sight, it will have weight in determining our course as to the retention or removal of the eyeball.

The unique character of the injury and the light which the progress of the case throws upon the prognosis of intra-ocular wounds justifies its resurrection from the records in which it has been buried for so long a time.

OPHTHALMIC THERAPEUTICS.—A REPORT

By G. MELVILLE BLACK, M. D.

DENVER.

The use of Argentum Nitrate in the various acute and chronic inflammations of the conjunctiva has been so satisfactory that it is with reluctance that we are induced to substitute another drug for it.

Hove, (*British Medical Journal*, Oct. 17,-96) recommends Argentamin as a substitute for nitrate of silver, claiming that, owing to its being alkaline in its reaction, it causes much less local reaction when applied to the conjunctiva than nitrate of silver.

We all know that the smarting and general irritability of the eye after argentum nitrate has been used has been one of the great drawbacks to its use. Hove claims that Argentamin is equivalent in every way in its results to silver nitrate, and is free from the many disadvantages of the latter.

I have been able to reduce the irritating effects of silver nitrate to a minimum by first instilling over the everted lids a four per cent solution of cocaine, then inverting the lids and waiting a few moments, then everting again and applying from a 1 per cent to a 2 per cent sol. of nitrate of silver, and with the lids still everted flushing the part with a normal salt solution. My experience has been that the results obtained are more satisfactory when the drug is applied in this manner, and that the patient suffers but little discomfort from its use.

The Journal of the American Medical Association, Vol. 28, No. 15. F. T. Smith reports a case of gonorrhoeal ophthalmia treated by Argonin in 5 per cent sol. with very satisfactory results. The eye had

previously been treated by the use of boric acid sol., bichloride sol., and nitrate of silver for two weeks without benefit. Under the use of Argonin, in four days time the discharge almost ceased, and the microscope showed but few gonococci, whereas previous to its use they had been very abundant. He claims that the use of Argonin is painless.

I am inclined to think that too many of us are afraid of strong solutions of nitrate of silver, whereas if the reverse were true, and solutions of silver of from forty to eighty grains to the ounce were used as above described early in gonorrhoeal ophthalmia we should not have occasion to look further for another abortive agent.

Archives Ophthalmology, part 2, Vol. XXVI. G. Herbert Burnham of Toronto advocates in "Indolent Creeping Corneal Ulcer" the use of a lotion of carbolic acid (1 to 20) dropped on the surface of the ulcer every two to four hours, day and night, with the instillation of a $\frac{1}{8}$ to $\frac{1}{4}$ gr. sol. of eserine 4 to 6 times in 24 hours. He also gives 3 grs. quinine internally four times a day.

This treatment should be productive of rapid and satisfactory results. It has long been my practice to cauterize such ulcers with pure carbolic acid, and use instillations of Formolin (1 to 1000) every three hours. We have in eserine a drug that should be more frequently used in corneal ulceration. The great contra-indication to its use is iritis, and even in iritis where the tension of the globe is found to be increased, an occasional instillation of eserine will be found to be of advantage, in that the atropine can be more frequently used. In corneal ulceration it is desirable to keep down the intraocular tension; eserine will do this, atropine will increase it, and yet we find a great many men using the latter as a routine practice.

Annals of Ophthalmology, Vol. V, No. IV. S. O. Richey of Washington, D. C., advocates the use of weak solutions of eserine of 1 to 4000 to 1 to 1000 with light taxis of the globe through the closed lids over the cornea and ciliary region. He claims that the taxis aids the contractile action of the pupillary muscular fibers, and empties the swollen veins of the fundus, and restores the iris and lens to their normal position. He also lays considerable stress upon the constitutional treatment to relieve high arterial tension. He recommends for this a general hot bath of from 105 to 108 F. together with the internal administration of sodium salicylate, ammonia, taraxacum and colchicum, with free catharsis from the use of Hunyadi Janos Water. This treatment is certainly rational, and especially so at this time when the

uric acid diathesis is claimed to play so important a part in the causation of many affections that have hitherto been without a known etiological factor. Again taxis will of itself reduce the intra-ocular tension. All that is required as proof is the manipulation of a normal eye through the closed lids for a few moments and the comparison of its tension with that of its fellow.

Journal of the American Medical Association, Vol. 28, No. 16. Frank S. Milbury, in an article entitled "Report of 76 Cases of Cataract Extraction with Remarks" says "on the third day the use of atropine is begun and continued twice daily." He does not say for how long. Such empiricism demands an answer. In this day of progression we demand a reason for the administration of any drug. If one cannot be given it would be better to administer nothing. The use of atropine as a routine practice after cataract extraction can certainly have nothing to recommend it. At times atropine would be indicated as it might be in many another affection. The majority of eyes after cataract extraction will get well much faster if they are left alone and the meddlesome practice abandoned of dropping various solutions into them, are in each case directly indicated.

Jacovides; (*Gazette hebdomadaire de medecine et de chirurgie*) speaks favorably of the use of Ichthyol in catarrhal conjunctivitis, phlyctenular conj., granular conj., purulent conj. and blepharitis. He uses a solution of this drug in water of from 30 to 50 per cent, and an ointment with vaseline base of from 2½ to 5 per cent. He asserts that the first action of the drug is to cause smarting with injection of the conjunctiva, but that in fifteen minutes the vaso-constrictive action of the drug asserts itself and the pain subsides. He finds that the ointments are better borne than the watery solutions. I have been using watery solutions of Ichthyol in the various conjunctival affections for several years, and have not had occasion to discontinue their use. There are cases which do not bear silver well; and it is in these cases that I have found Ichthyol to be of most value.

Dr. Hasket Darby in the *Boston Medical and Surgical Journal* for June 3rd, -97 reports as follows on the new local anesthetic Holocain; "1st, it does not enlarge the pupil; 2nd, it does not affect the accommodation; 3rd, it does not increase the intraocular tension; 4th, it promotes antiseptis; 5th, it may be used when cocaine is contra-indicated." He finds that it does not contract the blood-vessels, and in consequence operations performed under this anesthetic are more likely to be attended with hemorrhage. He says it cannot be injected subcutan-

ously owing to its poisonous properties. He believes the anesthesia to be more profound than that obtained with cocaine. It would seem to me that its only advantage is that it does not dilate the pupil. While there are not many times that such an anesthetic is desired yet such occasions do arise; e. g., in the removal from the cornea of a foreign body which is loosely impacted, and which renders undesirable the closing of the eye afterwards. The annoyance to the patient derived from a dilated pupil is considerable.

CORRESPONDENCE.

TO THE EDITOR OF THE OPHTHALMIC RECORD:

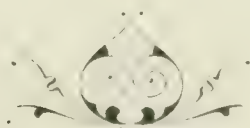
SIR :—A recent article written by Dr. Frank H. Edsall, of Pittsburgh, Pa., on "Some Causative Factors in Ulcerations of the Cornea," was antedated by one written by Dr. S. Lewis Ziegler, of Philadelphia, written for and read before the Pennsylvania State Medical Society May, 1894, and published in *New York Medical Journal* 3rd Nov., 1894. Both articles are very instructive and mean much to ophthalmic surgeons. In Dr. Edsall's paper he speaks of a latent cause in ametropia, which I believe is primary, weakening the resistance of both cornea and conjunctiva, rendering them susceptible to the nasal catarrhal poisoning.

Since reading Dr. Ziegler's article I've had but little trouble in treating phlyctenular cases. This little note is written to set right any mistake in priority.

Very respectfully,

JOHN S. KIRKENDALL, M. D.,
Ithaca, N. Y.

14 July, 1897.



REVIEWS.

A New Classification of the Motor Anomalies of the Eye, Based upon Physiological Principles.—By Alexander Duane, M. D., of New York, *Annals of Ophthalmology and Otology*, Oct., 1896, Jan. and April, 1897. This notable contribution to ophthalmology, being the prize essay of the College of Physicians and Surgeons of New York for 1896, has just appeared as a little book. (J. H. Vail & Co.)

“Based almost exclusively upon observations made by the author himself during the past ten years,” it bears throughout the evidences of great patience and industry in a most difficult field of research. More than this, a definite and practical object has been kept constantly in view, the author recognizing that “one who proposes a new classification must be prepared to defend his position by showing that it subserves some useful purpose.” This he has so done, that though some of his statements as to facts are open to serious criticism, and some of his clinical deductions are hence at variance with the experience of others, his work may justly claim the most careful study of ophthalmologists.

Much of the subject is familiar, and much original, while its scope is so wide that space requires that this review be rather critical than descriptive.

The new classification rests “upon a strictly etiological and physiological basis,” an evolution, as in the earlier classifications of other diseases, from the purely symptomatic, to the pathological and etiological features. Thus motor anomalies of the eyes formerly classified according to their symptoms as upward, downward, inward, and outward deviations, or according to Stevens’ classification, as hyperphoria, esophoria and exophoria, the author while admitting the provisional convenience of Stevens’ method, objects to it as a step backward by reinstating the idea of grouping deviations according to their anatomical expression and thus retiring their etiology to the background. Dr. Duane has simply gone farther onward in the etiological classification than his predecessors.

Following the various steps by which the proper classification of other diseases has been developed, Duane conceives that the problem of his classification is contained in the answers to the following questions:

“(1) What are the different normal functions of the neuro-muscular

apparatus of the eye, and what is their anatomical seat? (2) In what way is it possible for these functions to be deranged? (3) What means have we for telling whether any special function is deranged or not, and, if so, what the nature of the derangement is? (4) What are the conditions actually met with in practice, and how do they correspond to the scheme we have framed?"

These questions are considered in the order named, the first involving the movements of the normal eye, that is, the actions of the individual muscles, the possible movements of each eye separately through co-ordination of its six muscles, and the character and extent of the movements actually performed by the two eyes when acting together. Most of these are demonstrated in tabular form.

The originality which characterizes the greater part of the essay is here conspicuously wanting. It is unfortunate that a correct knowledge of the physiology of ocular movements should be the weakest portion of the very foundation of the author's edifice. If the laws of Listing and Helmholtz are correct, the author's statement and conception of the position of the eye in every movement, except those directly up, down, in and out from the primary position, are incorrect. He states that from a study of his diagram of the field of fixation (which is most useful, and admirably conceived), "all the various applications of the laws of Donders and Listing may be deduced," not perceiving that these laws are absolutely antagonistic, those of Donders being founded upon the apparent, and those of Listing and Helmholtz upon the actual positions of the eye. Thus while in both tables and diagram the superior and inferior recti are rightly credited with both an adductive and torsional action according as in certain positions of the eye the belly of the muscle forms an angle with the visual line, the externus and internus are, inconsistently, and in the face of mechanical laws, denied elevating, depressing and torsional actions in all diagonal positions of the eye. (Helmholtz, Hering.) It follows therefore, that the position of the upper end of the vertical meridian of the cornea (and retina), and the actions of the several muscles in every diagonal position of the eye, as given by the author, are incorrect. This confusion is the result apparently of accepting the statements of minor authorities, and from neglecting *personal* experiment. Space permits of but one illustration:

If the eye be moved vertically upward and fixes a point on a distant vertical line, the image of which is formed upon the vertical meridian of the retina, and the head be then rotated around the

vertical axis of the eye so that the latter looks upward and outward, and always immovably fixing the point and line, it is clear that the upper end of the vertical meridian of the cornea and retina will be inclined *in* toward the vertical plane of the head, *mainly by the external rectus*, the belly of which makes an angle with the visual line, and not be inclined out as stated by the author.

The physiological boundaries of the *field of fixation* have been carefully estimated, as well as the *amount of work done by each muscle in various movements*, but the results in the latter case are vitiated by the erroneous conception of the normal actions of the muscles. To illustrate, we quote:

"The maximum rotating effect of the superior rectus upon the vertical meridian (torsion effect) will be ascertained by determining the amount of deflection of the vertical meridian when the eye is directed far up and in. In this situation the vertical meridian is not acted upon by the other muscles capable of rotating it, [! E.] so that the total rotation which it undergoes must be ascribed to the action of the superior rectus."

In the above cited position, since (if Listing and Helmholtz are right), the vertical meridian is inclined *out*, the superior rectus cannot so incline it, but only modify the action of the internal rectus which *does* so incline it, the inferior oblique acting only as an elevator.

The determination of the *field of binocular single vision*, and of that of *binocular fixation*, and their differentiation are clearly set forth, as are also the phenomena of normal convergence, and the great excess of accommodation associated with actual convergence over that produced by prisms illustrated by the results of original experiments by the author.

In discussing the mooted question of the *true nature of divergence* being an active muscular contraction, or simply a relaxation of the interni, the author believes that it is "in part at least, an active process due to simultaneous contraction of the externi," a view borne out by three cases recently reported by Straub (*Centralblatt fuer Augenheilk.*, Jan., 1897), presenting symptoms of paresis of divergence without affection of the conjugate movements of abduction.

The *tests employed* are next considered with directions for applying them. These as given include inspection; the screen (cover) test; the author's parallax test; equilibrium tests with Stevens' phorometer or "prisms in trial frame"; test for divergence (abduction); determination of convergence near point both in the median line and in

lateral positions; test for convergence (adduction); diplopia test with candle, or card and dot, all of which tests the author states can be performed in ten minutes, and in addition, if requisite, the sursumvergence test and mapping of the field of fixation may be included. The author's methods of testing, and his estimation of the value of each, the tests and of their proper interpretation are valuable features of his work. As regards, however, the several equilibrium tests, it is likely that many experienced observers will not agree with Dr. Duane's in estimating their relative value, they holding that all of these should be made, as with Stevens' phorometer, with apparatus detached from the patient's face, not with a trial frame, which is largely responsible for the underestimation of the rod test, and renders prism tests often misleading and useless, and both tests contradictory to the phorometer, which, however correct, is far from being as delicate.

We come now to Part Second, which relates mainly to the pathology of the new classification, and includes clinical illustrations, diagnosis, prognosis and treatment. "The same principles which we apply to the physiology of the ocular movements, should also be applied to their pathology, * * * we should concern ourselves not simply with the disorders and weaknesses of the muscles as such, but also with the affections of all the various movements of which either eye alone or both together are susceptible." Duane then considers the question as to whether clinically we meet with pathological conditions which may be classified into groups corresponding with the physiological groups already given, and from "the results of the examination of quite a large amount of clinical material" answers it affirmatively, and then presents his *classification of the motor anomalies of the eye* in a synoptical table, the main divisions of which can only here be given, and then the more original applications considered briefly:

- (1) Anomalies of Individual Muscles or of their Nerve-nuclei;
- (2) Anomalies of the Association Centers for Parallel Movements;
- (3) Anomalies of the Center for Convergence-Movements;
- (4) Anomalies of the Center for Divergence-Movements;
- (5) Anomalies of Sursumvergence;
- (6) Anomalies of Rotation (Swivel or Torsion) Movements;
- (7) Mixed Forms. Many varieties including disorders of convergence-insufficiency or excess combined with divergence-insufficiency or excess. Each of the first five of these divisions are subdivided into the three forms of *under-action*, *over-action* and *perverted action*.

Before these divisions are taken up in detail, the phenomena of comitant and non-comitant deviations (preferred to the old terms with prefix *con*) are considered, and formulated into the following rules, which are clinically of great use:

“(1) *A deviation which increases or decreases in the performance of associated parallel movements by the eyes, signifies an anomaly of one or more of the ocular muscles—the direction in which it increases corresponding to that in which the action of the muscles affected is normally most pronounced.*”

“(2) *A deviation which remains constant or nearly so while the eyes are performing parallel movements is due, not to an anomaly of individual muscles, but to an anomaly of some one of the associated movements of the eyes.*”

“(3) *A deviation which increases as the eyes are converged denotes a convergence-anomaly, and one which increases as the eyes are passing from convergence to parallelism, a divergence-anomaly.*”

From a consideration, moreover, of the tendency of non-comitant to pass into comitant deviations, which is so common, the author enunciates the following law:

“A non-comitant deviation usually tends to become comitant, there being superadded to the morbid condition already existing, another by means of which the former is generalized and rendered sensibly equal throughout the whole field of fixation.”

In the section on anomalies of the individual muscles the subject of paralyses is passed over as having been “so thoroughly worked out and so ably presented by the two Graefes and Mauthner, that there is but little to add to this statement.” Further, under this section, especially worthy of remark is the presentation of the symptoms and differential diagnosis of the different varieties of muscular over-action (spasm), and under-action (pareses and paralyses), according to the author's own views, pointing out that the abnormality may affect either the muscle itself, its tendon, or the nerve or nerve-nucleus supplying it, and that it cannot be too strongly insisted upon that the resultant three varieties of deviations, “however dissimilar in origin, show in their symptoms and objective signs no real points of difference,” and that hence the diagnosis must depend on the history, etc. He states also that when secondary changes have taken place the diagnosis between over-action and under-action is often impossible, but that before this has occurred the differentiation may be made by considering certain of difference which he gives in a table of con-

trasted symptoms, worthy of study. The principles to be borne in mind in diagnosis of paralysis and spasm, are given, and while not new, are succinctly illustrated by Duane's abbreviated diagnostic table as formerly published, to which is added similar tables of lateral and vertical diplopia. These tables are evidently partially theoretical, and based upon the (to the reviewer) erroneous conception by the author of the anatomical and physiological actions and coördinations of the normal muscles. A study of the tables gives this impression, and it is to be remembered that torsional anomalies due to one muscle are only to be detected in the earliest stages of its paralysis. It is therefore more than probable that in the diplopias recorded in the tables for the diagonal positions of the eye, the externi and interni are often in a state of spasm or paresis. This was certainly so in some of the early cases of paresis of the superior rectus, from the physical signs described by the author. (*Archives of Ophthal.*, Vol. XXIII., No. 1.)

The treatment of anomalies of the individual muscles advocated, is according to clearly stated principles and appears eminently sound and rational, and Duane has done a great service if his warning be heeded that "It is probably from a failure to conform to these principles that a large part of the disappointment occasioned by the results of tenotomy done for heterophoria, is due."

As having little clinical importance we pass from anomalies of Associated Parallel Movements to the sections on Anomalies of Convergence and of Divergence, which, in their relation to "muscular asthenopia," both the plague and despair of the practical ophthalmologist, are the best every day guides we have yet met with. A large amount of useful knowledge is here compressed into small space, yet with a reason for every statement, and with a consistent relation to the plan of the whole work, and to the principles laid down from the first. After giving the conditions present in testing for convergence-insufficiency (under-action), it is considered as *non-accommodative* (due to weakness from operation, to divergence excess, or to insufficiency of an elevator or depressor muscle); and *accommodative* (due to non-use of accommodation, uncorrected myopia, to corrected hyperopia, and to presbyopia.) The treatment presents nothing new, and others beside the reviewer, may differ as to its being "a safe general rule to correct myopia, and under-correct hyperopia whenever much exophoria exists."

Convergence-excess is described along the same lines as its insufficiency, the physical signs being as remarkably clear, definite and

original in their grouping, as well as the causes, symptoms and the evidences of its complications with divergence-insufficiency.

Divergence-insufficiency and excess as distinctly different conditions from convergence-excess and insufficiency, are perhaps the most novel and valuable features of the author's classification, but most valuable of all are the tables of contrasted physical signs by which primary divergence-insufficiency, with secondary convergence-excess, is to be differentiated from primary convergence-excess with secondary divergence-insufficiency; and primary divergence-excess with secondary convergence-insufficiency, from primary convergence-insufficiency with secondary divergence-excess. A careful study of these points will convince those who have striven to solve puzzling cases of asthenopia, that many of them can only be solved by the facts and on the principles given in this record of the careful investigations of Dr. Duane. No review could give an adequate idea of their true value. Only when carefully recorded physical signs of cases are compared with his diagnostic rules, and the principles upon which these rules are founded, are understood, will the knotty points be made clear.

Above all it is to be hoped that American ophthalmologists will fairly weigh the merits of this classification, and that its author may some time in the near future produce a work on motor anomalies in which his observations along the lines he has so far followed, will be more detailed and full than possible within the limits of a prize essay.

F. B. EATON.

Cataract and its Association with the Gouty and Rheumatic Diathesis, etc.—By Dr. S. D. Risley, of Philadelphia, in an able paper read before the *Congress of American Physicians and Surgeons*, May 4th, 1897, discusses some etiological factors in diseases of the eye, which have been overlooked, or, to say the least, only meagrely considered by a large number of practitioners.

It is stated and pretty clearly shown that the etiology of not a few ocular affections common to middle life and old age, may be distinctly traced to some diathesis superinduced by faulty metabolism of the systemic tissues, rather than, as commonly current, to approaching age; for instance, as one would infer from *senile* in classifying hard cataract.

Doctor Risley assumes the logical position that it is unreasonable to expect the delicate nutrient membrana of the eye alone to escape disaster of a disease affecting the entire vascular tree, complicating

heart, liver and kidneys with generally impaired functions of nutrition. "It is not to be supposed," he says, "that under these conditions the ocular blood vessels can escape * * * or that the eye alone should escape the general impairment of the nutritive functions.

It is under these conditions that the ophthalmic surgeon encounters retinal arterio- and phlebo-sclerosis, the sero-exudate, and in other cases hemorrhagic retinitis, which indeed is only a great number of small retinal apoplexies, very significant and occurring usually in the later stages of nephritis, in perivaseculitis, hemorrhagic glaucoma and the choroidal disease, which precedes and in a large measure is an etiological factor of incipient cataract.

These diseases producing a change in the structure of the blood-vessels of the nutrient membrana (the choroid)—a change which steadily progresses as the lithic acid or other diathesis interferes with the general functions of nutrition and systemic vascular degeneration, give accentuation to the various forms of eye disease, and furnishes a group of symptoms invaluable to the painstaking physician.

"It should be borne in mind that, while the lens loses its elasticity and becomes hard or even straw-colored as age advances, and by this manifests its participation in those inevitable changes quite correctly regarded as senile, it, nevertheless, is only in exceptional instances that it loses its transparency to a degree which seriously impairs the acuity of vision. It is, moreover, true that in many persons of great age, and in others where the signs of senility are exceptionally pronounced, the transparency of the lens is preserved to the last, as demonstrated by their excellent sharpness of vision. When, therefore, the lens undergoes not only physiological hardening, but becomes also opaque, it should suggest the presence of pathologic causes for this extraordinary occurrence."

It is not surprising that the lens and vitreous body, being avascular structures, should early suffer from impaired nutrition, especially when we consider "the unstable equilibrium of the component transparent cells of the lens" which are so readily disturbed "by qualitative change in its environing fluids. The peculiar susceptibility to change of the osmotic qualities of the fluids in and about the lens, being well known, still further inclines to this view.

The author contends, "that the gouty rheumatic diatheses are among the most frequent causes of chronic subacute forms of disease affecting the uvea."

Two illustrative cases are given which are of special interest to

me because I have treated very similar ones and find my experience corroborative of Dr. Risley's.

Mrs. S., age 62 years, consulted Dr. Risley in 1884, complaining of headaches in recurring attacks, at which times she suffered from photophobia, lachrymation, undue tenderness to palpation, etc. "The lenses were strongly reflecting and a few opaque speculæ were present in the lower and inner periphery of each. The retinal arteries were relatively small and had gray borders near the optic nerve. The veins were relatively large and dark with gray outline in places and in others granular borders. The choroid was honeycombed, while yellowish spots and splotches were distributed throughout the eye ground. * * * The details of the fundus were slightly blurred, * * * the anterior part of the vitreous filled with a fine sand-like deposit." She had high tension pulse, shortness of breath in exertion, no heart murmurs. Urine 1028, heavily loaded with uric acid. Recurring redness and tenderness of joints, chalky concretions and clear history of gout on paternal side for three generations. During the progress of the trouble her vision had fallen to $\frac{1}{2}$, with freely floating opacities in the vitreous. "To all appearances she is now the victim of rapidly maturing cataract. The present state has been reached by frequently recurring exacerbations of mild gouty attacks."

"Although it may not be possible to trace the degeneration of the lens fibres directly to the presence of uric acid or its salts in the nutrient fluids which surround it, it is highly probable that its nutrition suffers impairment through the disease of the membranes upon which it, in common with the other ocular tissues, depends for suitable pabulum." Further on he says: "I have, in three instances, seen curious and interesting changes suddenly occur in the refraction of diabetic patients during acute exacerbations of their disease presumably due to changes in the lens, which once more resumes its normal state when the great excess of sugar has disappeared from the urine, and presumably also from the tissues." Again, "Furthermore, it is a significant clinical fact, as bearing upon the conclusion of this paper, that the ectodermic structures of which the lens is one, and the connective tissue in and about the joints where it is most dense and comparatively avascular and, therefore, where nutrition is most easily retarded, are precisely the localities which suffer earliest and most constantly in the evolution."

"That the existence of advanced atheroma adds to the risks of operation for cataract is unquestionably true. This was demonstrated

in the case of an aged woman, already published, the subject of advanced atheroma, blind with over-ripe cataract in both eyes. The usual section was completed, but before the next step in the operation could be taken, she cried out with violent pain in the occiput. The lens was forcibly extruded from the wound and was followed immediately by a profuse gush of a yellowish vitreous fluid, and this by a stream of bright red blood, so copious as to run over the face and saturate the pillow. The brittle intraocular blood-vessels had ruptured under the removal of their usual support, afforded by the ocular tension, which was suddenly disturbed by opening the anterior chamber. The eye was of course lost, but what is of more significance in this discussion is the fact that a month later she became the victim of a fatal intra-cranial apoplexy."

A. W. CALHOUN.

BRITISH MEDICAL ASSOCIATION.

The OPHTHALMIC RECORD has completed arrangements with the Wabash and Canadian Pacific Railroads for a rate to Montreal and return for those desirous of attending the meeting of the British Medical Association, to be held in that city, August 31st to September 3rd, inclusive.

Only those who have received invitations from the executive committee will be permitted to take part in the proceedings of the meeting, although any member of the medical profession and their families, who desire to make the trip to Montreal, are cordially invited to join the party.

It is the intention to leave Chicago from Dearborn station, corner of Polk and Dearborn streets, at 3:10 P. M., Sunday, August 29th, arriving in Montreal the following evening.

Special sleeping car accommodations will be provided for the party. The berth rate from Chicago to Montreal is \$5.00. Those desiring reservations made in the sleepers, or who wish further information should apply promptly to the Editorial Secretary, 1102 Reliance Building, Chicago.

ABOUT THE JANUARY "RECORD."

There have been so many unexpected requests for the first number of the RECORD that the edition is entirely exhausted. We would feel greatly obliged to those of our readers who may have received extra copies of the January number if they will return them to us at our expense.

THE OPHTHALMIC RECORD

A Monthly Review of the Progress of Ophthalmology.

VOL. VI.

CHICAGO, AUGUST, 1897.

NO. 8. NEW SERIES

EDITORIALS.

ILLUSTRATIONS OF MEDICAL AND SCIENTIFIC SUBJECTS.

In this age of progression "Of the making of books there is no end," many of which go unread or are but little considered on account of pages of dry description which might well have been avoided by even a crude illustration. A properly illustrated article is more apt to be accepted by the publisher and to be thoroughly read than one which is not. Illustrated papers are in demand by the general public and the pages of any technical work are brightened by the insertion of illustrations when necessary. "*One illustration is worth a page of description.*" The OPTHALMIC RECORD will always be found in the lead of journals of its class and the management is pleased to state that it is disposed to consider articles which are accompanied by well drawn illustrations. Even if crude, illustrations may be redrawn and thus be fitted for the pages of the RECORD. The beautiful plate on "Angioid Streaks in the Retina" illustrating de Schweinitz' article in the July number is an example of what may be done in reproductive work from first class copy. This was reproduced from a water color drawing of Margaretta Washington by the Binner Engraving Co. of Chicago by what is known as the 3 color process. It is in fact a colored photograph. The water color drawing is placed before a camera and 3 negatives taken; interposed between the drawing and the negative are screens which permit of the passage of yellow, red and blue light; prints are taken from these negatives upon sensitized plates which are chemically etched and finished only in part by hand; from these the separate colors are laid and printed. This is a modification of the photo-tint process as is used by the majority of magazines. It is much cheaper and more effective than wood engraving or lithography. Pencil or pen drawings, brush illustrations or old prints are likewise readily reproduced by this method.

H. V. W.

OPHTHALMOLOGY IN THE MEDICAL CURRICULUM.

As an indication of the improved status of ophthalmology in the medical curriculum, we draw attention to the number and quality of the following questions (there was no oral examination this year) submitted to the fourth year class in medicine of one of our leading universities. Attendance upon the lectures is compulsory, and the student must pass a satisfactory examination:

Examination in Ophthalmology, University of Pennsylvania.

May 19, 1897. Prof. W. F. Norris.

I. WOUNDS OF THE EYEBALL.

- a. Foreign bodies in the cornea, dangers, sequelae and treatment.
 - b. Perforating wounds of the eyeball.
 1. Where the lens is wounded in the pupillary space.
 2. Where there is prolapse of the iris, or where it is lacerated or cut.
 3. Where foreign bodies lodge in the vitreous chamber.
- Prognosis, sequelae, and treatment in each instance.

II. PURULENT CONJUNCTIVITIS.

In the adult and in the new born.

Causes, symptoms, diagnosis, course, sequelae, prognosis, treatment.

III. ULCERS OF THE CORNEA.

Describe the appearance of some of the principal varieties of corneal ulcer, e. g., those occurring in catarrhal, in purulent, and in phlyctenular conjunctivitis; also abscesses of the cornea.

Give the symptoms, sequelae, prognosis and treatment in each instance.

IV. IRITIS.

Anatomical and clinical varieties, symptoms, course, sequelae, and treatment. Differential diagnosis between iritis and acute conjunctivitis. Differential diagnosis between iritis and acute or subacute glaucoma.

V.

What are our standards of good vision, and how have we arrived at them?

What are the methods of testing the acuity of vision? What tests have we for the illiterate?

VI. ACCOMMODATION.

- a. What is accommodation, and how produced?
- b. What is the normal range of accommodation in a healthy emmetropic eye at the age of 25 years?
- c. What are the effects of myopia and hypermetropia on the range of accommodation?
- d. Name some of the principal drugs which we use to stimulate the accommodation and those which temporarily annul the accommodative power.
- e. Give the strength of the solutions of these drugs which are usually employed, and state some of the inconveniences and dangers which may result from their use.

VII. FIELD OF VISION.

- a. What is the extent of the normal field of vision?
- b. What are the methods of measuring it?
- c. What is homonymous lateral hemianopia, and what are the various ways in which it may be produced?

VIII. HYPERMETROPIA.

Definition, symptoms, sequelae, and treatment.

IX. ASTIGMATISM.

- a. What is regular astigmatism?
- b. What is irregular astigmatism?
- c. Symptoms.
- d. Effects on radiating lines and on letters.
- e. Give one of the simpler methods of finding the amount of astigmatism in any given eye.

X. GLAUCOMA.

Give its nature, varieties, pathology (methods of production), symptoms, prognosis, and treatment.

C. A. W.

OPHTHALMOLOGY AND GENERAL MEDICINE,

It has become extremely common in recent years for the young graduate in medicine to advance himself at once into the domain of the specialist, and this, without the training or experience in the general school that develops the chief requisite of the specialist, mature judgment. This is doubtless responsible for many evils, and tends undoubtedly, to lower the high level that expert specialism should al-

ways hold. In consequence, it forms a legitimate subject for editorial comment and criticism. This invasion of the youth of the profession is especially noticeable in ophthalmology, and its kindred specialties. Gynecology, the next most popular line of work is somewhat protected, as the patients themselves, demand a reasonable degree of maturity, and the operations are so responsible, dealing as they do with life itself, that the youth, fearful of the danger to himself, seeks other and more experienced aid. In ophthalmology, however, there is no such protection, and consequently, the step from the medical schools to the full-fledged oculist, is easy, and becoming more popular every day. I have been especially able to note this tendency during the last five years of my teaching life. In each succeeding class, a number of the students pass directly from the class room to the Polyclinic, pursue a course of from six weeks to three months and then begin their special life work. Sometimes they lack the grace of this small preparation and decorate their window with the word "Oculist," immediately on leaving college. And yet, the necessity for prolonged experience in general medicine, before taking up the problems to be met with in ophthalmology, is a very real one. The close relationship that many ocular diseases bear to the general system, the fact that many of the most serious lesions, met by the oculist, are directly caused by diseased conditions in distant organs, makes patent the necessity for more elaborate and exhaustive general training before one becomes exclusively devoted to special work. The remedies for this evil must rest either with the conscience of the practitioner, who must soon recognize the great injustice of his position to his public, or in the punishment that frequent failures bring.

W. E. H.

THE DUTY OF THE MEDICAL EDITOR TO MEDICAL SCIENCE.

The medical editor has to steer between the danger of discouraging able but inexperienced writers and that of allowing a large part of his space to be filled with more or less trashy material. A survey of our periodical ophthalmic literature certainly indicates that, up to a very recent period, American editors, with rare exceptions, have considered the first-named danger the more formidable. In other words, they have stood more in fear of their contributors than of their readers, with the result that many of the articles which they have

published display neither originality, novelty nor erudition. This not only wastes the readers' time and money (for the expense of printing unimportant articles necessarily raises the cost of the whole journal), but, what is more important, it constitutes a distinct obstruction in the path of scientific progress. The specialist, in the vast majority of cases, writes, not simply to unburden his soul, but to keep his name before the medical public, and if he can accomplish this by a series of mere pot-boilers, the temptation to neglect more serious work is one which the busy, the lazy or the ignorant man, however able, often finds impossible to withstand; while if editors were to adhere rigidly to a high standard for admission to their pages, the same men would find the time or take the trouble to do really first-class work. This opportunity to elevate the standard of medical literature is one which no editor should hesitate to improve. By improving it, he may reduce the number of his original articles, but those which he publishes will eventually give to the stamp of his journal a value which the best men will appreciate. Offence will occasionally be given and feelings hurt, but the man who sends in an imperfect review of some well-ventilated subject will perhaps have his attention turned to better things, or at least may learn to save his time; the observer or inventor who from inexperience or lack of library facilities is led to think his case more rare or his method more novel than the facts warrant, certainly, if he is fair-minded, should be grateful for the wider information which the editor may be able to furnish; while the man with a well-established name who dashes off a hasty sketch of some rather unimportant case will, let us hope, on musing over his returned MSS., realize that he is one of those whose reputations need to be defended from themselves.

The insinuation above made, that much of the original matter in American ophthalmic journals has been trashy, may sound too sweeping. What is meant is that these journals (with one notable exception), along with a majority of really valuable articles, have published in nearly every issue, one or more contributions which would find no place in the best European journals; not even in the more avowedly practical ones of Zehender and Hirschberg. Within the past eighteen months, however, there have been signs of a decided improvement in this respect, and if the ophthalmic profession will give it encouragement, the tendency toward a higher standard will doubtless continue.

H. G.

MISCELLANEOUS

BRITISH MEDICAL ASSOCIATION

The Sixty-fifth Annual Meeting of the British Medical Association will be held at Montreal on Tuesday, Wednesday, Thursday, and Friday, August 31st, September 1st, 2nd, and 3rd, 1897.

President—Henry Barnes, M. D., F. R. S. E., Senior Physician to the Cumberland Infirmary, Carlisle, Eng.

President-Elect.—T. G. Roddick, M. D., Professor of Surgery in McGill University, Montreal.

President of the Council.—Robert Saundby, M. D., F. R. C. P., Physician to the General Hospital, Birmingham.

Treasurer.—Charles Parsons, M. D., Dover.

An address in Medicine will be delivered by Wm. Osler, M. D., F. R. C. P., Professor of Medicine in the Johns Hopkins University, Baltimore. An address in Surgery will be delivered by William Mitchell Banks, F. R. C. S., Surgeon to the Liverpool Royal Infirmary. An address in Public Medicine will be delivered by Herman M. Biggs, M. D., Director of the Bacteriological Laboratory of the Health Department, New York City. The Scientific Business of the meeting will be conducted in Eleven Sections.

THE SECTION ON OPHTHALMOLOGY.

President: Edward Nettleship, F. R. C. S., London. *Vice-presidents*: F. Buller, M. D., Montreal; R. A. Reeve, M. D., Toronto; Ed. Desjardins, M. D., Montreal; A. A. Foucher, M. D., Montreal. *Honorary Secretaries*: W. H. Smith, M. D., Winnipeg; Jehin Prume, M. D., Montreal; Thomas Herbert Bickerton, M. R. C. S., Liverpool. It is intended that a discussion should take place on the Prevention of Accidents to the Eyes of Persons Engaged in Industrial Employments. The following gentlemen have expressed their intention of contributing papers to the section.

Bickerton, T. H. (Liverpool) (1) The Question of Color Vision in the Public Services; (2) on Mules Operation.

Buller, Dr. F. (Montreal) Abnormalities in the functions of the Extrinsic Ocular Muscles.

Foucher, Dr. A. A. (Montreal) Auto-infection in Pustulous Keratitis,

Fulton, Dr. John F. (St. Paul, Minn.) Amblyopia of Strabismus.

Jehin-Prume, Dr. Jules (Montreal) A Contribution to the treatment of the Syphilitic Affections of the Eye.

Lee, Charles G. (Liverpool) On an Unusual Case of Orbital Tumor.

Wurde mann, Dr. H. V. (Milwaukee, Wis.) Relation of Skiascopy to other Objective and Subjective Methods for the Estimation of the Ocular Refraction (with exhibition of Hand Skiascope).

Specimens.—Specimens will be shown by Mr. Treacher Collins and Mr. Priestly Smith. (*British Medical Journal*.)

MACULAR CHOROIDITIS.



You ask what are my symptoms?
 My mind is quite distraught ;
 I seem to see
 In front of me
 A most gigantic spot.

Light scintillates behind it
 And figures seem to dance ;
 Sometimes a limb
 Shoots from the rim,
 A head or heads perchance.

The spot is most uneven,
 And often broad and high,
 On which erect
 Great plumes project,
 Of network ply on ply.

I've reached descriptive limits,
 And now, I'll draw for you
 A silhouette,
 That yon might get
 A satisfactory clue.

GEO. R. BRILL.

-*Louisville Times.*

THE OPHTHALMIC RECORD

A Monthly Review of the Progress of Ophthalmology.

VOL. VI.

CHICAGO, SEPTEMBER, 1897.

NO. 9. NEW SERIES

ORIGINAL ARTICLES.

A NOTE ON THE USE OF DE ZENG'S REFRACTOMETER.*

By S. LEWIS ZIEGLER, M. D.

Ophthalmic Surgeon to St. Joseph's Hospital,
Philadelphia.

ILLUSTRATED.

This ingenious instrument, in its present state of perfection, has been in use by the writer during the past year and a half, and a few remarks concerning its uses and advantages may prove of some interest to the profession. Its purpose is to accomplish, without the use of a mydriatic, the estimation of the *total* refractive error of the eye, and particularly, to measure with accuracy the whole amount of astigmatism present in *all* the dioptric media of the eye, and to indicate its exact axis.

Manifestly, the only proper way to prove or disprove the merits claimed for the Refractometer is by making a series of comparative tests between three different methods: (1) By the instrument itself, without the use of a mydriatic; (2) By the use of the instrument, under a mydriatic; and (3) By a careful test with the lenses of the trial case, under complete mydriasis. If a series of such tests should reveal a uniformity of results, we would, of course be compelled to acknowledge the reliability of this instrument. The writer has now in preparation such a series of tests, which will be tabulated and presented at an early date, together with the conclusions to be drawn from the observations recorded.

We have appended a few illustrative examples at the end of this

*The Refractometer is the invention of H. L. De Zeng, Jr. It is manufactured by the American Optical Co., of Buffalo, N. Y.

paper, however, in order to show the possibilities of the instrument in the estimation of the more complicated refractive errors.

While we do not believe that any mechanical device will wholly replace refraction under a mydriatic, we must, nevertheless, concede that *such an instrument has a distinct sphere of usefulness, entirely aside from its employment in routine refractive work; viz.,* (1) In the measurement of eyes where a mydriatic is contra-indicated; (2) in the measurement of eyes where a mydriatic is refused; (3) In cases where a mydriatic cannot be used for lack of time; (4) In estimating the *distance correction* of presbyopes whose accommodation is only partially inactive; (5) As help in quickly ascertaining the character of the correction required, where the refractive error is an obscure one; and (6) In testing the refractive errors of school children (for statistical purposes), where mydriasis cannot be used. Furthermore, for *practical refraction* the Refractometer possesses an advantage over Javal's Ophthalmometer, in that it reveals the *total astigmatism* of all the media, while the Ophthalmometer shows only the corneal irregularity.

The method employed in testing with the Refractometer is that known as the "Fogging System," which consists in creating a temporary or "artificial myopia" by over-correcting a hypermetropic eye with a convex spherical, or under-correcting a myopic eye by a concave spherical sufficiently weak to deeply blur all the lines on the astigmatic fan. In this way the accommodation is induced to relax as far as possible, and the *latent* error may thus be developed and measured along with the *manifest*.

It is claimed by the inventor of the instrument, that, through the application of this system in the use of the Refractometer, its high condensing properties will admit sixteen times the volume of light to the retina under myopic conditions that is admitted under similar conditions when a simple test is made with the trial case; and furthermore, that the increased retinal stimulation towards relaxation of the ciliary muscle, arising from the accumulated volume of light focused in front of the retina, will allow the Refractometer to develop and measure more latent error than any other instrument not supplemented by a mydriatic.

For the benefit of those who have not used the Refractometer, we will append a brief description of the construction, adjustment, and method of using the instrument.

CONSTRUCTION:—The construction of this instrument as shown in Fig. 1, consists in a section of brass telescopic tubing, (H),

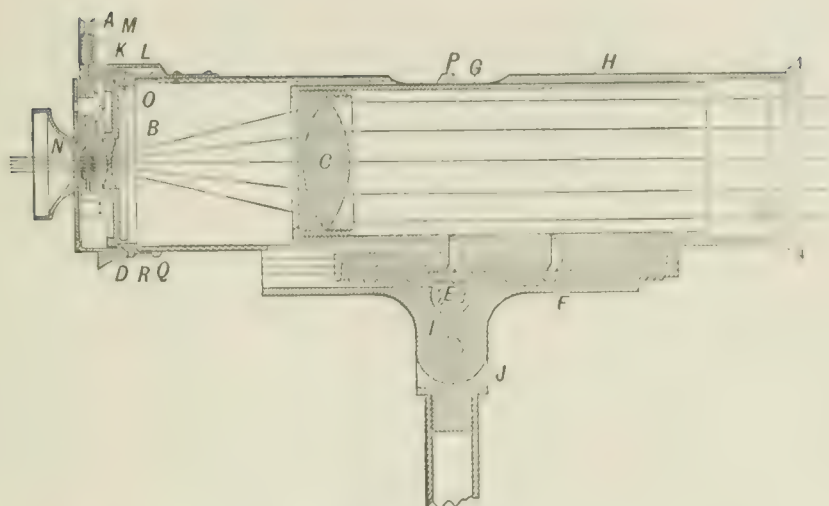


Fig. 1. Longitudinal Section of the Refractometer

about eight inches long by two and a quarter inches in diameter, mounted at its center on an adjustable upright pillar (J), and containing an inner tube moveable along its cylindrical axis by means of a rack and pinion adjustment. This inner tube carries at its front end a convex achromatic objective (C) of approximately ten dioptries focus, which when in combination at different distances from the stationary negative eye-piece situated in the head of the instrument, gives all the spherical foci from $S+0.12\text{ D}$ to $S+18\text{ D}$, and from $S-0.12\text{ D}$ to $S-9\text{ D}$ inclusive. The convex (plus) spherical effects thus obtained are recorded upon a revolving dial secured to the pinion at the side of the rack and pinion adjustment. The concave (minus) spherical effects are recorded upon a sliding scale marked upon the top of the inner sliding tube, and exposed through an oval opening in the top of the outer or main tube, (those under $S-1.50\text{ D}$ being duplicated on the revolving dial.)

Both the revolving and sliding scales are supplemented by a pointer; the one to the revolving scale being stationary, while the other to the sliding scale is adjustable for the purpose of setting the instrument, so that it will correctly record the effects obtained at any range at which it is desired to use the instrument, varying from 3 to 6 meters, or from 10 to 20 feet. The revolving dial should be adjusted to its pointer in such a way that it may report correctly in accordance with its sliding scale. Owing to the range of the negative scale being limited to $S-9\text{ D}$, two auxiliary caps accompany the instrument, one containing $S-10\text{ D}$, and the other $S-20\text{ D}$, which may be placed over the eye-piece when required, thus raising the negative scale to either $S-19\text{ D}$, or to $S-29\text{ D}$, respectively.

The outer or main tube has at its front end a revolving head, composed of two revolving discs, containing blanks, a stenopaic slit, and eleven concave (minus) cylinders with their axes set at right angles with their radii. The cylindrical lenses contained in these discs are arranged as follows: In the front disc we have a blank (O), 1.50, 3.45, 6, 7.50, and 0.12. In the back disc we have a blank (O) 0.25, 0.50, 0.75, 1, 1.25, and a stenopaic slit (S). Through this arrangement the power of any lens in one disc may be added to that of any one in the other disc, and as a result combinations equivalent in power to all the cylindrical lenses from 0.12 D, to 1.37 D, inclusive, can be formed in divisions of 0.12 D, and those from 1.50 D to 8.75 D, inclusive, can be formed in divisions of 0.25 D.

The axes of these cylinders are indicated by means of a stationary pointer on top of the head of the main tube, which marks the degrees on the beveled scale encircling the front of the revolving head. The revolving head of the instrument is rotated by means of a thumb-screw and cogged-gear adjustment, so that the exact axis of the cylinder exposed may be accurately and quickly determined. The two cylindrical carriers have their edges milled and beveled, and incline towards each other. They are provided with figures on the back faces, indicating the power of the cylindrical lenses contained in the apertures opposite them, so that the power of the lens exposed at the eye-piece may be readily determined. These discs are provided with spring stops for indicating the correct position of the lens.

Attached to the right side of the tube, near its rear or open end, is a "finder," similar to those used in photographic cameras. It consists of a small tube, having a convex lens set in its rear end, a plane mirror placed at an angle in the front end, and a ground glass screen set in the side towards the operator, on which two lines intersect at right angles to each other. At this point of contact the image of the test card should appear when it is located in the center of the visual field of the Refractometer, thus permitting the operator to properly direct the instrument towards the test-card, without himself viewing the object by looking through the eye-piece.

The instrument as now perfected is shown in Fig. 2. It is mounted upon an iron tripod, or upon an adjustable wall bracket. The supporting rod is capable of a vertical adjustment of about 9 inches. The external surface of the brass tube is highly polished, and lacquered or nickered. The revolving head, eye-shade, pointers, diaphragms and inner surfaces of the tube are oxidized a dead black. The eye-

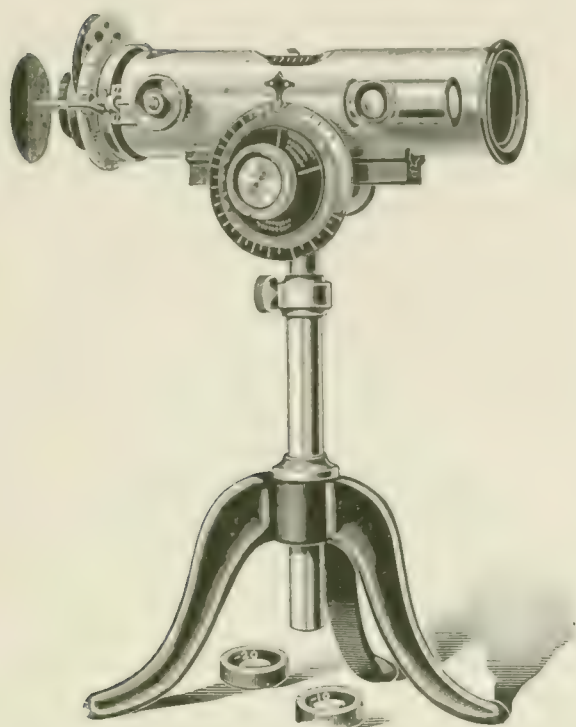


Fig. 2. De Zeng's Refractometer.

shade is reversible, and can be detached for convenience in carrying. All the lenses of the instrument are accurately centered, the objective being one of excellent quality, and perfectly corrected for spherical and chromatic aberration.

By reason of the instrument's optical construction, it has an amplification of two and one-third diameters, and in consequence of this the test types furnished with it are reduced to $\frac{2}{3}$ of the size of Snellen's letters, so that the visual acuity may be reliably estimated with the instrument by the same *relative* scale of test letters as that usually employed.

ADJUSTMENT:—The instrument must be properly adjusted for whatever range is desired, either 3, 4, 5 or 6 meters (or the equivalent in feet), according to the amount of space available. The card containing the test types and astigmatic fan (Fig. 3) should be hung in a good light at the range selected, and the distance between the upright of the instrument and the face of the test-card accurately measured. The small indicator on the top of the instrument should be loosened, by turning its screws and sliding it along until the desired graduation on the scale of this adjustable indicator stands opposite the stationary pointer below it. The screws are then fastened, and the focusing adjustment turned by the thumb-screws on either side of the instrument, until the zero graduation upon the sliding scale of the

tube comes exactly beneath the previously adjusted indicator. The revolving scale (or dial) on the right-hand side of the instrument is next loosened by holding the thumb screw on the left-hand side of the instrument and turning the thumb-screw on the right-hand or dial side toward the left until the dial is free; the dial is then rotated until

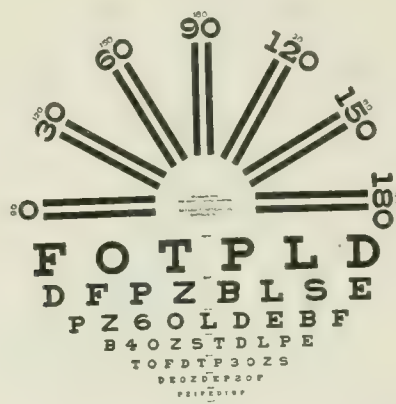


Fig. 3. Test Letters and Astigmatic Lines for use with Refractometer.

its zero mark stands opposite the indicator, and is made secure at that point by again turning its thumb-screw fairly to the right.

Before the test is begun, the instrument should be set accurately on the zero graduation of both scales (which should accurately correspond), and the zero marks of the two discs containing cylindrical lenses, should be set opposite the 180° division of the beveled scale on the head of the instrument. It is also necessary to so arrange the instrument that the test-type card shall appear in the center of the visual field. This is done by looking into the finder on the side of the instrument, and so adjusting it that the test-card appears at the intersection of the cross lines on the ground glass screen. The reversible eye-shade is then turned to the side of the instrument, opposite to that of the eye we desire to refract, so that both eyes may be kept open during the test, and thus avoid squinting.

DIRECTIONS FOR USE:—The patient should sit behind the Refractometer, with the brow of the eye to be tested resting against the cup of the eye-piece, and the eye-shade covering the other eye. The operator should sit on the right or dial side of the instrument, locate the test-card through the "finder," set the instrument at zero, and then turn the focusing adjustment by means of the thumb-screw, until the observer sees the test-types distinctly. When this point has been

reached, the thumb-screw should be again turned to the right, far enough to cast a decided blur on all the radiating lines of the astigmatic fan, thus producing a temporary or "artificial myopia." This formerly distinct to the observer (as described), the instrument should be clearly focused on the test-letters with as *much* hyperopic or as *little* procedure will encourage the relaxation of the accommodation, and thus enable the operator to diagnose and accurately measure any refractive errors that may be present in the eye under examination.

After this blurring of the astigmatic fan (by turning the focusing adjustment to the right), the thumb-screw should be turned back slowly to the left. If the patient states that one or more lines of the astigmatic fan appear more distinct than the others, there is astigmatism present. If, however, the radiating lines preserve a uniform shade of blackness, there is no astigmatism present, the eye being simply myopic or hypermetropic, as the indicators show; or emmetropic, if they point to zero.

In astigmatism one or more lines may come into normal prominence, while the others, or right-angle lines, remain blurred, and can only be rendered uniformly clear by means of the concave cylinders contained in the revolving discs situated in the head of the instrument. After obtaining one clear meridian in the astigmatic fan by turning up the proper spherical, the opposite or right-angle lines are corrected by turning the head of the instrument so that the axes of the cylinders contained in the revolving discs shall lie parallel with the blurred lines; then rotate the cylinder discs until a lens is found of sufficient power to render the lines uniform in appearance. Again "fog" or blur the test-card, by turning the thumb-screw as at first, and slowly return to the same reading. If the card becomes clear at the same point as before, the first reading is correct. If not, continue the test until uniformity is secured. The power of the cylinder exposed at the eyepiece should be read from the back face of the disc exposed for manipulation (after it has been clicked into position), the figures being seen directly above the 180° graduation. If two cylinders are used add them together; their sum is the total strength of cylinder exposed.

The exact location of the axis of the cylinder in use should be accurately determined by a partial rotation of the head of the instrument backwards and forwards, until the point is found where the cylinder in use appears to be most acceptable to the eye; or where the radiating lines in the astigmatic fan are most uniformly seen, the exact axis thus obtained being accurately indicated by means of the pointer

on the beveled scale marked in white figures about the instrument's revolving head.

After all the radiating lines in the astigmatic fan are rendered unimyopic effect as possible. The white figures on the revolving scale attached to the focusing adjustment indicate Hypermetropia, and the red figures Myopia. All the figures on the sliding scale exposed through the opening at the top of the instrument's main tube, indicate Myopia; and the accompanying auxiliary caps, when added to the eye-piece of the instrument, increase the power of the sliding Myopic scale by either S—10. D or S —20. D, respectively.

TO RECORD THE RESULTS:—In Hyperopia, Myopia, Myopic Astigmatism, Compound Myopic Astigmatism, and Mixed Astigmatism, the reading is *direct*, the record being made from the exact reading on the scale of the instrument. Mixed Astigmatism is of necessity found as plus sphere of lower power and a minus cylinder of higher power, and is so recorded; e. g., +1. D. sph. \ominus —2 D cyl. ax. 180°.

On the other hand the reading for Hyperopic Astigmatism, and Compound Hyperopic Astigmatism must be transposed: e. g., +1. D. sph. \ominus —1. D. cyl. ax. 180° is equivalent to +1. D. cyl. ax. 90°; and again +3. D. sph. \ominus —1. D. cyl. ax. 165° is equivalent to +2. D. sph. \ominus +1. D. cyl. ax. 75°.

RULES FOR PRESCRIBING:—The prescription for glasses is made on the same basis as for mydriatic corrections, where all the latent error has been developed. In other words, those who are accustomed to order a reduction in the spherical correction in order to allow some "play" for the accommodation, will follow their usual custom; while those who prefer to order full spherical corrections are afforded an opportunity to do so.

In Hyperopia we should choose the *strongest* glass that permits *distinct* vision of the small test-letters; while in Myopia the *weakest* glass that gives clear vision should be selected. The astigmatic correction is, of course, absolute, and always ordered as found. In prescribing for cases of Presbyopia the customary allowance for age should be added to the distance correction, in order to bring up the near or reading vision to the proper range.

Before concluding this brief sketch, we desire to cite a few illustrative examples in the use of the Refractometer, covering as wide a range as possible, and accompanied by a record of the complications found present in each individual case.

CASE I. *Simple Hyperopic Astigmatism, with Hyperhorio.* Miss A. T.,

aged 36. Vision in O. D. $\frac{20}{20}$, reads J. No. 4; O. S. $\frac{20}{20}$ reads J. No. 4. Hyperphoria O. D. P. 1° base up.

With Refractometer, O. D. +1.50 D. sph. \ominus -1.50 D. cyl. ax. 45.

O. S. +1.50 D. sph. \ominus -1.50 cyl. ax. 135

which, when transposed, is equivalent to

O. D. +1.50 D. cyl. ax. 135 $= \frac{20}{20}$.

O. S. +1.50 D. cyl. ax. 45 $= \frac{20}{20}$.

A test under atropia gave the same result. There was ordered,—

O. D. +1.50 D. cyl. ax. 135°

O. S. +1.50 cyl. ax. 45° \ominus P 1° base down.

Case II *Compound Hyperopic Astigmatism, with beginning Presbyopia.*

Mr. F. M., aged 40. Vision in O. D. $\frac{20}{30}$ reads J. No. 2; O. S. $\frac{20}{30}$ reads J. No. 2. Orthophoria. History of styes

Refractometer Shows, O. D. +1.75 D. sph. \ominus -0.50 D. cyl. ax. 180°

O. S. +1.87 D. sph. \ominus -0.37 D. cyl. ax. 180°,

when transposed is equivalent to

O. D. +1.25 D. sph. \ominus +0.50 D. cyl. ax. 90° $= \frac{20}{20}$.

O. S. +1.50 D. sph. \ominus +0.37 D. cyl. ax. 90° $= \frac{20}{20}$.

Atropia was then ordered, and the above result confirmed. An order was given for,—

O. D. +0.75 D. sph. \ominus +0.50 D. cyl. ax. 90°.

O. S. +1. D. sph. \ominus +0.37 D. cyl. ax. 90°. Distance

Add $\left\{ \begin{array}{l} \text{O. D. +0.50 D. sph.} = \text{J. No. 1.} \\ \text{O. S. +0.50 D. sph.} = \text{J. No. 1.} \end{array} \right.$ Reading

These have been comfortably worn (in bifocals) for some months.

Case III. *Simple Myopic Astigmatism, with Hyper-Exophoria, and Sub-normal accommodative power.*

Miss E. S., aged 20. Vision O. D. $\frac{20}{200}$, reads J. No. 8; O. S. $\frac{20}{200}$ reads J. No. 8. Hyperphoria O. D. P. $\frac{1}{2}^\circ$ base up, Exophoria P 1°

Refractometer shows, O. D. -1 D. cyl. ax. 180° $\frac{20}{20}$

O. S. -1 D. cyl. ax. 180° $\frac{20}{20}$.

This result was confirmed under a mydriatic, and the following ordered,—

O. D. -1 D. cyl. ax. 180° \ominus P $\frac{1}{2}^\circ$ base up

O. S. -1 D. cyl. ax. 180°. Distance.

Add $\left\{ \begin{array}{l} \text{O. D. +1 D. sph.} = \text{J. No. 1} \\ \text{O. S. +1 D. sph.} = \text{J. No. 1.} \end{array} \right.$ Reading.

These have been worn with comfort for over a year in bifocals.

Case IV: *Compound Myopic Astigmatism, with Hyper-Exophoria.* Miss E. R., aged 20. Vision in O. D. $\frac{20}{40}$, reads J. No. 1; O. S. $\frac{20}{40}$ reads J. No. 1. Hyperphoria O. D. P. $\frac{3}{4}^\circ$ base down. Exophoria P 2° .

Refractometer shows, O. D. -1 D. sph. \ominus -0.50 D. cyl. ax. 180° $\frac{20}{40}$

O. S. -1.50 D. sph. \ominus -0.12 D. cyl. ax. 180° $\frac{20}{40}$.

Although the patient was opposed to the use of mydriatics, consent was secured to use Homatropine; which test absolutely confirmed the above result. The full correction was ordered with prism.

O. D. -1 D. sph. \ominus -0.50 D. cyl. ax. 180° \ominus P $\frac{3}{4}^\circ$ base down.

O. S. -1.50 D. sph. \ominus -0.12 D. cyl. ax. 180°.

This has been worn constantly for one year with comfort

Case V. *Mixed Astigmatism, Compound Myopic Astigmatism, and Hy-*

per Exophoria. Miss R. C. aged 23. Unable to use eyes for reading more than half-hour at a time. Vision O. D. $\frac{20}{70}$, reads J. No. 4: O. S. $\frac{6}{200}$, reads J. No. 6. Hyperphoria O. D. P 2° base down, Exophoria P 6° . Mydriatic was strongly objected to, and not urged, owing to constitutional contra-indications. The Refractometer showed,—

O. D. +0.50 D. sph. \ominus — 2.25 D. cyl. ax. $150^\circ = \frac{20}{70}$ pt.

O. S. — 4. D. cyl. \ominus — 2.25 D. cyl. ax. $60^\circ = \frac{20}{70}$ pt.

Full correction was ordered for constant use, together with prisms, as follows:—

O. D. +0.50 D. sph. \ominus — 2.25 D. cyl. ax. $150^\circ \ominus$ P 3° base down ax. 140° .

O. S. 4. — D. sph. \ominus — 2.25 D. cyl ax. $60^\circ \ominus$ P 2° base in.

Although, as stated, this test was not confirmed under a mydriatic, nevertheless the patient reports comfort, after six months constant use of the glasses.

Case VI. *Presbyopia, with Hypermetropic Astigmatism, Mixed Astigmatism, Hyper-Esophoria.*

Mrs. H. G., aged 44. Vision O. D. $\frac{20}{70}$ pt., reads J. No. 8: O. S. $\frac{20}{50}$ pt. reads J. No. 6. Hyperphoria O. D. P 1° base up. Esophoria P 2° . Test with Refractometer shows.

O. D. +4.50 D. sph. \ominus — 4.50 D. cyl. ax. 180° .

O. S. +4.50 D. sph. \ominus — 5.00 D. cyl. ax. 80° ,

which, when transposed is equivalent to

O. D. +4.50 D. cyl. ax. $90^\circ = \frac{20}{70}$ pt.

O. S. — 0.50 D. sph. \ominus +5.00 D. cyl. ax. $170^\circ = \frac{20}{70}$.

Under atropia the same result was found, by trial case.

O. D. +4.50 D. cyl ax. $90^\circ \ominus$ P 1° base up.

O. S. — 0.50 D. sph. \ominus + 5. D. cyl. ax. 170° . Distance.

Add { O. D. +2. D. sph. = J. No. 1.

{ O. S. +2. D. sph. = J. No. 1.

Reading.

These have been worn (in bifocals) for more than a year with great comfort.

In conclusion we can only add that the use of the Refractometer has demonstrated its capacity to correctly measure the total refractive error of the eye without preliminary mydriasis. Whether it will do this in all instances can only be proven by a large number of tests. Furthermore the degree of success attained will depend largely on the skill of manipulation evinced by the operator, as well as the amount of intelligence shown by the patient. An extended trial of the instrument will be necessary, therefore, in order to prove whether or not the Refractometer is destined to become a valuable addition to the armamentarium of the progressive ophthalmologist.



A PROBABLE CASE OF THROMBOSIS OF THE LOWER CENTRAL RETINAL VEIN.

By J. HERBERT CLAIBORNE, M. D.,

New York

ILLUSTRATED

The patient, an extraordinarily stoutly built Jewish woman of 31 years of age, stated; that, on closing her right eye she found she could not see with the left one. I saw her for the first time three days after this observation.

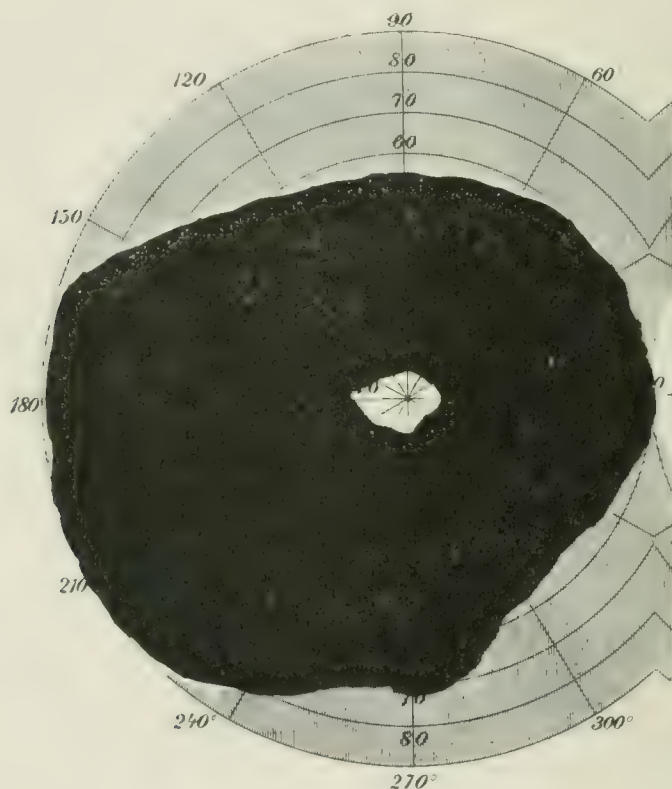
She said she was absolutely blind in the left eye. The pupil of that eye was normal in size, like the other; the consensual reaction was present, likewise the associated accommodative reaction, but with the right eye closed the left pupil was dilated moderately, and fixed. There was no consensual contraction in the right when the direct rays of a gas jet were focused on the left eye. This showed that there was no light perception in the left eye. On examining the fundus, it was found that the disc was normal; there was a small feathery hemorrhage between the disc and the macula, but the veins, particularly the lower one, presented an interesting spectacle. The latter was much engorged as far as the eye could follow it, but a short distance from the edge of the disc, it suddenly swelled into a sausage-like shape, and continued so on to the disc, until just before it plunged into the optic nerve fibers, it became suddenly constricted. The engorgement was so marked that the blood in the vein appeared coagulated, and was black-red. The sudden sausage-like swelling of the vessel was so evident, and it stopped in such an abrupt way just before it plunged into the optic nerve, that no doubt was left in my mind that I had before me a case of thrombosis of the lower retinal vein. The upper vein was likewise much engorged, but it was uniformly swollen and presented no such fusi-form dilatation as the lower one. I sent the case to Dr. W. A. Holden, in order that the appearance of the fundus might be recorded on imperishable paper, but owing to a misunderstanding he failed to see the patient when she called at his office. I left the city at this juncture and did not return for two weeks.

On my return I found the vein quite large, but the sacculated swelling of it had disappeared; so had the retinal hemorrhage. She claimed to be still perfectly blind, and the pupillary reflexes were as I had first observed them. Dr. Holden now saw the case, but could not find anything to draw, and expressed some doubt as to my diagnosis.

I saw her again in a month. At that time she counted fingers at two feet. Complained that everything was still very dark, and could not tell which way I moved when directly in front of her face. The right pupil now reacted slightly to consensual light, and there appeared to be a slight direct reaction in the left eye. In another month the vision was $\frac{15}{200}$ with a concentrically constricted field. She could not read print, but could recognize red and green in the field. The direct reaction of the pupil was about the same as at the last observation.

The optic disc showed the picture of true white atrophy. I saw her again in April 1st of this year, that is about six months after the blindness was first noticed. The optic nerve was dead white except just toward the inner side where the ves-

sels arose from the nerve. The arteries were very small, the veins rather large. The direct and solitary accommodative reaction were fairly good in the left eye, and the consensual contraction was good in the right. She picked out letters correctly in Jaeger No. 2, in English. The vision for distance was $\frac{3}{70}+$. The field as shown by the accompanying chart, taken with Skeel's self-registering perimeter, is remarkably small. It is also very remarkable that she can see as well as she does within the field. The perception for red and green is good in the entire field which remains.



In the *Annals of Ophthalmology*, July, 1896, Dr. T. A. Woodruff reports a case of thrombosis of the central retinal vein, presents a fundus drawing of the condition, and reviews the literature of the subject in a cursory way.

Woodruff's case was that of a man of 48, who was in sound health, but complained of cloudiness before his eye on rising in the morning. Woodruff based his diagnosis on the suddenness of the attack, the similarity of the fundus changes to neuro-retinitis, the presence of numerous hemorrhages, constricted arteries, and dilated, tortuous, sausage-like veins. This picture is indeed similar to neuro-retinitis hemorrhagica.

Würdemann, in the *Archives of Ophthalmology*, Vol. XXIII, 1894,

reports the case of a child of 8 years who had mumps two weeks before complaining of sudden blindness of one eye. The fundus drawing of this case showed a startling likeness to the one of Woodruff, and strongly suggested optic neuritis as his did. The disc was obliterated, but not swollen; the arteries were small and were lost at the edge of the disc; the veins were dilated and tortuous, sausage-like, with black-red apparently coagulated blood in them. There was serous exudation around, and a red spot at the macula, suggesting the picture of embolism of the artery. He based his diagnosis on hemorrhage into the nerve and retinal tissue, the stasis of the venous circulation, and the sausage-like look of the veins. The vision was entirely lost, and the eye was enucleated for microscopic examination.

Mules reports two cases in the *Trans. of the Oph. Soc. of the United Kingdom*, 1889. He reviews the opinions of Hutchinson, Michel, Angelucci, and Gowers on this subject. Michel has reported a number of cases of central venous thrombosis. Angelucci's cases were all attended by cardiac, and general vascular changes of a serious nature. Dr. Wecker asserts that all cases of venous thrombosis are due to optic neuritis. Mules set out in his paper to show that this is not true. He gives a fundus picture of one of his cases in which there was no sign of optic neuritis. The upper retinal vein bifurcated just beyond the disc; before its bifurcation it showed a stem which was distinctly exsanguinated and pale. After its bifurcation, both branches were turgid and swollen with dark red blood. The lower vein was likewise much swollen, but there was no sign of blocking in it. There were numerous flame-shaped hemorrhages present. There was a large central scotoma, but the periphic field was normal. Three months later the hemorrhages were gone and the vision was Jaeger 20.

After the lapse of 5½ years' the vision and field were the same as three months after the attack. His second case showed an enormously swollen dark-red upper vein, which ran nearly to the edge of the disc in this condition, when it became a pale pink, till it was lost to sight in the nerve head. The fundus and disc were otherwise normal.

J. B. Lawford's case, published in the *Transactions of the Oph. Soc. Un. King.*, 1891, showed extensive hemorrhages in scattered patches, patches of whitish exudation, small retinal arteries, large veins exhibiting alternate dilatation and constriction, a portion being dilated and bended, then narrowed and even in outline. V. = Fingers at one foot. The loss of vision was sudden.

Knapp in the *Archives of Oph.*, Vol. XIII., 1884, relates a case of

thrombosis of the retinal vessels from orbital cellulitis following upon facial erysipelas. His description is accompanied by instructive fundus drawings. The optic disc was obliterated and swollen, the vessels radiating from it as a center. The veins were very large, tortuous and swollen; there were numerous hemorrhages of a flamed shaped character, and also deeper seated ones. The final result was complete atrophy of the nerve, and obliteration of the lumen of the majority of the vessels. A few remained partly filled with blood, the others were like white threads on the red background. He regarded the condition as due to the compression of the orbital blood-vessels by the products of inflammation.

It will be observed that while there has been a decided similarity between some of the cases I have reported, eminently those of Woodruff, Knapp, Würdemann and Lawford, there is a distinct dissimilarity between these and the cases of Mules, particularly his second one. These bear a striking resemblance to mine.

The discovery of the blindness was apparently accidental, according to the statement of my patient, but I am inclined to think that there was some reason for the discovery. The presence of the hemorrhage, although it was a solitary one, pointed to a vascular cause, and this with the sacculated, fusiform, leech-like dilatation of the lower vein, and congestion of the upper one, and the obvious constriction of the lower vein just before its entrance into the nerve, make this view still more reasonable. The sudden blindness, the resultant atrophy, and the final greatly diminished visual acuity and contracted field, place the diagnosis, in my opinion, beyond peradventure.

It is singular that the central vision in the remaining field should be so good, but this is consistent with the fact that the color perception also is good in this area. I believe that the field is in reality a trifle larger than is shown in the chart, but the patient was so little intelligent in her answers that I was compelled finally to accept the field as you see it.

It will be seen that the literature of this subject is not large. If I add a case (singularly like my own) described by Wilder before the Chicago Oph. and Otol. Society in the *Journal of the Amer. Med. Association* for March 27, '97, I shall have collated definitely nine references, Knapp's, and my own being included.

I think I may say in conclusion that *thrombosis of the central retinal vein is rare, that it is usually attended by sudden blindness, which is complete or incomplete, that the final result is complete or partial atrophy*

of the optic nerve, and that the fundus changes vary considerably.

1. H. V. Würdemann, *Archives of Ophthalmology*, Vol. XXIII., 1894.
2. J. B. Lawford, *Trans. Oph. Soc. United King.*, 1891.
3. C. Michel, *Graefe's Archiv. fuer Oph.*, Vol. XXIV.
4. P. H. Mules, *Trans. Oph. Soc. United King.*, 1889.
5. Angelucci, *Aura d' Ott.*, p. 187, 1891.
6. Knapp, *Archiv. of Oph. and Otol.*, July, 1896.
7. T. A. Woodruff, *Annals of Oph. and Otol.*, July, 1896.
8. W. H. Wilder, *Journal Amer. Med. Assoc.*, March 27, 1897.

PROPER PREPARATION OF THE YELLOW OXIDE OF MERCURY OINTMENT.

By GEO. F. KEIPER, M. D.,

Eye and Ear Surgeon to St. Elizabeth Hospital and St. Joseph Orphan Asylum
Of La Fayette, Ind.

Dr. Wm. D. Babcock in the August number of the OPTHALMIC RECORD deploras very much the proper preparation of the yellow oxide of mercury ointment and its keeping qualities. Judging from the article it must be difficult in other places to procure satisfactory yellow oxide of mercury ointment. With these facts in mind, the following description is offered in the hope that if the directions are carefully followed anybody anywhere may have a satisfactory preparation which will keep both in the light and in the dark at any temperature under 100° Fah. To Dr. G. K. Throckmorton of our city is due the credit of showing us how to do it while a pharmacist here in 1884. To make flour paste and avoid lumps, it is a matter of common sense that instead of dumping all the flour into the water at once we take a small quantity of water and a little flour and mix them very thoroughly together. Then add some more flour and a little water and mix again, and thus continue until all is mixed and a beautiful paste is made. This takes time. The same method must be pursued in the preparation of the yellow oxide of mercury ointment. Take a little vaselin, which should melt at 100° Fah., and smear the mortar and pestle. Then add a little of the yellow oxide of mercury and triturate thoroughly and take lots of time to do it. Then add a little more vaselin and some more yellow oxide, and thus continue until all is used that the prescription calls for. The stiffer the vaselin, the longer it will

take. The mortar may be slightly warmed if preferred, and this will facilitate matters. The ointment thus prepared must be stored in glass or porcelain. If stored in tin decomposition is sure to take place.

Another way which seems equally as good and which was published a couple of years ago in the *Indiana Medical Journal* is to mix the two ingredients together with a shell or rubber spatula, adding the two gradually while mixing. In this case it is best to use one of those porcelain mugs in which blue mass comes in bulk.

ULCERATIVE INFLAMMATIONS OF THE CORNEA.*

By ELLET ORRIN SISSON, M. D.,

Professor of Anatomy and Director of the Histological and Pathological Laboratories of the
College of Physicians and Surgeons,

Keokuk, Iowa.

Ulcerative inflammations of the cornea is a subject which, if properly treated, would require an exhaustive article, taking into consideration the clinical aspects of the several varieties and the technique of the therapeutic measures adopted for their relief. Therefore allow me to state that Keratitis Lagophthalmos, Keratomalacia and Keratitis Neuroparalytica, although coming as they do under the head of ulcerative inflammations of the cornea, and properly deserving a place in this paper, if I were to adhere strictly to my subject, will not be considered, and we will pass to the more common forms of the disease, viz., ulcers of the cornea and abscesses of the cornea.

One author in treating of diseases of the cornea, says: "The importance of a knowledge of the diseases and injuries of the cornea, depends on their great frequency, coupled with the fact that nearly every one of them is liable to leave behind it some opacity, with resulting defect of sight and disfigurement of the eye; while several are very apt to lead to complete loss of sight." Frequency and grave sequelae, the two essential conditions required of any disease to make its study a duty and its care a responsibility. Before considering any one of the forms of ulcerative inflammations of the cornea, a moment's reference to the structures of the parts involved would not be amiss.

We know that the cornea is composed of five layers, an anterior epithelial, consisting of several layers of cells, a thin homogeneous membrane known as Bowman's, the stroma or the corneal tissue proper, constituting the largest portion of the structure, Descemet's

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membrane homogeneous in character, forming the posterior boundary of the cornea, and lastly a single layer of epithelium (endothelium) coating the posterior surface of Descemet's membrane. The cornea in many respects is a peculiar structure. Here we have a tissue which contains no blood vessels, yet by a unique arrangement of lymph spaces and canals, it receives nutrition. We have in Descemet's membrane a resistant structure, which far exceeds its apparent strength. When the entire stroma of the cornea has already broken down into pus, we often see the thin Descemet's membrane for days still offering a complete barrier to the ingress of the products of inflammation, and in many cases remaining unimpaired.

Etiology.—Passing to the etiology of ulcerative inflammations of the cornea we find several predisposing causes. FIRST, its exposed position, rendering it particularly liable to injuries from without, either in the form of direct traumatism or the lodgment of foreign bodies. SECONDLY, although I find no mention made of it in the text-books consulted, I believe the corneal circulation just alluded to, forms a predisposing cause for inflammation in this tissue: the sluggish movement of the lymph, as compared with the active circulation of the nutritive material in other parts of the body, causes it to yield readily to any inflammatory process. The exciting causes are the same as set up inflammation in any other tissue of the body. The introduction of micro-organisms into the tissue of the cornea, either the result of traumatism or an existing disease of the appendages of the eye. The micro-organism may exist as a specific organism, as in acute blenorrhœa, or to the presence of schizomycetes and especially to the staphylococci, discovered by Ogston, and more accurately described by Rosenbach. The presence of fungi has for a long time been a matter of demonstration in the great majority of cases, the ordinary pus fungi and in rare cases fungi of another sort. Leber found the *Aspergillus glaucus* in the cornea in a case in which the injury had been produced by a beard of oats; similarly in a case of injury by a pear, an undetermined species of Hyphomycetes was discovered by Berliner, in the inflamed cornea. These were undoubtedly introduced into the cornea through inoculation by means of the foreign body which caused the injury. That the inoculation does actually take place, experiments have proven. Ebert was the first to demonstrate that by introducing fungi into the cornea, fungus colonies were developed which made their way between the lamella of the cornea, so that a cloudiness in the form of a rosette was produced: cultures of the *Aspergillus glaucus*

and *Leptothrix buccalis*, produced similar results. In abscesses we have infection by way of metastasis (endogenous infection). It is observed in abscesses which occur in acute infectious diseases such as small pox, scarlet fever, measles, typhus, etc.

Pathology.—Every ulcer of the cornea in contradistinction to an abscess, develops from a superficially disposed infiltrate. If we make an expert examination in the beginning, we notice a cloudy spot upon the cornea, and the surface over it somewhat dull. Soon an exfoliation of epithelium takes place upon the surface of this spot, resulting finally in a loss of substance in the parenchyma of the cornea, and we have produced a typical ulcer. This is first surrounded by infiltrated portions, a fact which we recognize by the base of the ulcer being of a gray color, and uneven, also its walls likewise gray and clouded, slender gray striæ extend from the ulcer in different directions, into the transparent cornea. We have now what is usually termed a progressive ulcer. From this point on we may have the ulcerative process limiting itself, simply to the tissue, which was from the very beginning too strongly infiltrated to live and the ulcer becoming rapidly clean without involving any more of the corneal tissue. This is called the regressive stage, which is shortly followed by the stage of cicatrization, leaving an opacity of a greater or less degree, or simultaneously with the breaking down of those parts most strongly infiltrated, the inflammatory cloudiness keeps spreading, new portions of the cornea being constantly attacked by the infiltration. These portions break down into pus and the ulcer increases in size, either in the direction of depth, or along the surface, in the former case frequently leading to perforation of the cornea, and in the latter, larger and larger areas of the cornea may be destroyed, resulting in the production of extensive opacities. Abscesses of the cornea, although different in many respects from an ulcer, at the same time, present many conditions common to both. The essential character of an abscess consists in the fact that the purulent infiltrate is situated in the deep layer of the cornea, while in an ulcer the collection of pus lies open anteriorly. But sooner or later we have an enlargement of the abscess and a breaking down of the anterior wall, converting it into an ulcer, and from this point on, the pathological process, is similar to the one just considered.

Symptoms. It is not necessary to dwell at length upon the symptoms of corneal ulceration, as they are familiar to all, the progressive stage, characterized in the majority of cases by irritation like ciliary injection, lachrymation, photophobia and pain, which in some cases

becomes very intense, hyperemia, and even inflammation of the iris. There are, however, cases of ulceration in which the irritative symptoms are very slight, or are wanting altogether, cases constituting what are called torpid or asthenic ulcers; these often prove very dangerous, and from the very fact of their not being accompanied by the usual train of symptoms, make it important for the attending physician to keep careful watch over the case.

Complications.—Before considering the treatment of ulcerative inflammations of the cornea, it is proper that I should mention a few of the many complications that almost invariably arise during the course of the disease, and in the majority of cases, bring about the fatal results that we so frequently see. The foremost complication is perforation of the cornea, with prolapse or hernia of the iris. You will notice that I say "with prolapse of the iris," for a simple perforation of the cornea at a point where the iris can be kept from entangling itself in the wound, is a result to be desired rather than regretted, for it usually leads to an abatement of the symptoms, and a rapid healing of the ulcer, but where we have a prolapse, either partial or, as sometimes occurs, complete, it greatly augments the danger in the case, and unless the protruding iris can by operative interference, aided by proper therapeutic measures, be restored to its former state, the prognosis as to a successful termination is bad, resulting in either a staphyloma or a large flat opaque cicatrix at best.

Luxation of the lens is another complication that may be expected. This is associated with a considerable degree of stretching of the Zonula of Zinn, or a rupture of that structure, if its fibers have been rendered fragile by disease, which is frequently the case.

Intraocular hemorrhages are the result of the rapid diminution in tension, by virtue of which an increasing quantity of blood flows into the vessels of the interior of the eye, which have been then suddenly relieved of extraneous pressure and causes their rupture. Hemorrhages follow, if the perforation takes place suddenly, or if the eye was previously under an abnormally high tension. In some cases the entire contents of the eyeball are extruded and the patient may be in danger of bleeding to death. In cases where there is extensive destruction of the cornea, and especially where the suppuration is of a particularly virulent character, as in acute blenorrhoea, the process may be carried over into the deeper parts of the eye, and lead to the destruction of the latter by purulent irido-cyclitis, or panophthalmitis. There is probably a greater liability to complications in corneal abscesses than

in corneal ulcers, as they are nearly always accompanied by hypopyon. And the presence of the products of inflammation in the anterior chamber, is calculated to involve the deeper structures of the eye to such an extent that irreparable damage is done to the sight, if it is not lost entirely.

Treatment.—As to the treatment, it will necessarily be a reiteration of the methods laid down in the several text books, rather than the advancement of any new therapeutic measures. These will vary according to the etiology and the stage in which the case presents itself. Ulcers, the result of traumatism, must be carefully examined for foreign bodies, and if any are present, they must, in every case, be removed. Where the ulcer is the result of a conjunctival lesion, the treatment of the latter generally results in the ulcer advancing toward recovery. The *indicatio morbi* requires in most cases the application of a bandage, either lightly or firmly, in the first instance serving simply as a protection to the eye, which is especially indicated in recent ulcers, and in the latter acting as a support to the recently formed cicatrix. A contra-indication against the bandage is furnished by the presence of a profuse secretion simply from the fact that the discharge in the conjunctival sac by the closure of the lids, would remain in constant contact with the ulcer.

The remedy *par excellence* in the treatment of corneal ulcers and occupying the position next in order to the bandage is atropin. In combating the inflammation of the iris, it diminishes the general state of irritation, and so reacts favorably upon the ulcer itself. With these two remedies alone—the bandage and atropin—we attain our object in light cases. But, in the more severe forms, other remedies must be adopted and surgical interference is generally necessary. Moist warm compresses are generally productive of much good, if their application is properly carried out. Iodoform has proven most beneficial. A French surgeon has lately recommended the application of pure tincture of iodine to the ulcer once a day. He reports that a decided improvement was manifest in each case, even after the first application, and by a continuance of the application, the ulcers healed rapidly. Doctor Louis B. Crouch, in an interesting article in the *New York Medical Times*, reports an extreme case of corneal ulcer, which he cured by literal feeding of the perishing tissues, with beef serum. The case was one in which the central portion of the cornea became yellow, infiltrated and densely opaque, while around it appeared extensive serpiginous ulcerations. He says

that it was plainly apparent that unless new elements of nutrition were speedily obtained, a sloughing of the cornea and an evacuation of the contents of the eyeball were inevitable ; being struck with the idea of direct corneal feeding of beef serum by endosmosis, he immediately proceeded to utilize it. Obtaining plenty of juicy round-steak he applied the juice expressed therefrom, almost constantly to the wrinkled and shrunken cornea. There were plain evidences of improvement from the beginning, which continued uninterruptedly.

The cornea gradually lost its haziness, the ulceration healed without a scar, and to-day he reports "the eye as bright and clear as its fellow." The application of the beef serum to the cornea was continued steadily until the inflammation, swelling, and pressure upon the corneal blood vessels had subsided sufficiently to allow the natural resources of nutrition to resume their wanted functions. If, in spite of the remedies mentioned, the ulcer is evidently spreading, the actual cautery introduced by Gayet, should be employed and a thorough cauterization of the diseased portion made. This in nearly every instance, checks the morbid process and results in rapid healing of the ulcer. It can almost be said to have revolutionized their treatment. A small sharp-pointed cautery iron, or the galvano-cautery loop, or Paquelin's thermo-cautery, are the instruments usually employed. Paracentesis of the anterior chamber, is another potent remedy for combatting rapidly spreading ulcers. The good results derived from the operation are apparent to us in cases where spontaneous perforation takes place. In the large majority of such cases, the ulcer heals with a complete subsidence of all the distressing symptoms immediately following the perforation. Therefore why not forestall nature by a puncture of the cornea, thus preventing the ulcer from enlarging superficially, giving us the advantage of a small linear opening instead of a large ragged one, and, as a result, the liability to a prolapse of the iris is not nearly so great.

Passing to the regressive stage or stage of cicatrization, the treatment should then be directed in a manner that will tend to produce a resistant and transparent cicatrix. To accomplish this end irritants are recommended, beginning with the weaker, and if these are well borne, passing to the stronger ones. Powdered calomel is valuable as a mild irritant, and Fuchs recommends such astringent preparations as the *collyrium astringens luteum* and the *tincture opii crocata*.

Now, in conclusion, let me say, that by a study of these two forms of *Keratitis suppurativa*, we have fully impressed upon us two facts :

First, in any disease process involving the cornea, we have a condition which, because of the importance of the structure involved, demands our immediate attention. *Second*, that in this disease we have one, the etiology of which can be traced to the introduction of micro-organisms, either by ectogenous infection or entogenous infection, and therefore all remedies in order to successfully combat the disease must be of an antiseptic nature.

TRAUMATIC ENOPHTHALMUS.

By W. E. BRUNER, A. M. D.,

Cleveland, Ohio.

Clinical Assistant in Ophthalmology, Medical Department, Western Reserve University; Consulting Oculist to the Cleveland City Hospital.

ILLUSTRATED.

Numerous cases of traumatic enophthalmus have been reported—thirty-one in all according to a recent article of Zimmerman (*Archives of Ophthalmology*, Vol. XXVI p. 38)—and various explanations have been assigned to account for the condition, cicatricial contraction of the retro-bulbar tissue, paralysis of Müller's orbital muscle from lesion of the sympathetic, fracture of the trochlea of the superior oblique, atrophy of the orbital tissue due to a lesion of a nerve center or tract, particularly of the sympathetic or the trigeminus, and fracture of the orbital walls.

Without attempting to dwell upon the merits of these various theories, I wish to report a case in which the enophthalmus, while it may have been increased by reason of some of these other causes, as atrophy of the orbital tissue (or injury of the sympathetic) is due chiefly, if not entirely, to fracture of the orbital walls.

C. W. R., age 33 years, consulted me March 23rd, 1896, with the history that on January 6th he fell into a pit, striking on his head and breaking his nose and the outer edge of his right orbit. A piece of the malar bone was removed. He was not rendered unconscious. There was so much swelling that he could not see with the eye for several days, and when the swelling subsided so that he could open the eye he had diplopia, one object appearing above the other and decidedly tilted. Since then the inclination has decreased but the distance apart of the two objects has remained about the same. He is accustomed to throw his head backward considerably to avoid the diplopia. He has slight pain at times above the eye. He is dizzy when he closes O. S. and attempts to use O. D. alone. The right side of the face has a sunken appearance involving the whole malar bone and orbital edge of the superior maxillary bone. Several scars are present now of which however are attached to the underlying bone. There is one scar 12 mm. long extending horizontally from the side of the nose just below the lower margin of the orbit.

and another one 22 mm. in length extends from a point 1 or 2 mm. below a line horizontal with the external canthus upward along the edge of the orbit. There are several small scars on the forehead. The bottom of the orbit can readily be felt and the finger can be introduced between the eye-ball and roof of the orbit as is impossible on the left side. The upper lid droops decidedly and shows a deep furrow in it just below the brow. The ptosis is purely mechanical, due to the sunken eye and not to any paralysis of the lid muscles. There is decided downward deviation of the eye. It can move freely in all directions except upward in which direction it can move only $10-15^{\circ}$ above the horizontal. The appearance of the patient is well shown in the accompanying photographs. In Figure 1 he is looking directly at the camera while in Figure 2 he is looking upward as far as possible.



Fig. 1.



Fig. 2.

Vision O. D. = $\frac{1}{4}$? O. S. = $\frac{2}{3}$?

Accommodation:

O. D. = Jaeger no. 1 pp. $23\frac{1}{2}$ cm.

O. S. = Jaeger no. 1 pp. 24 cm.

The pupils are equal and respond to light and in accommodation. Form and color fields of O. D. are perfectly normal.

Ophthalmoscopic examination: O. D. = media clear, disc round, slight physiologic cup, slight choroidal disturbance at the outer edge, edges of disc somewhat hazy; some striation of the retina, disc good color and vessels normal in size and distribution, some uncovering of the choroidal circulation in the periphery and slight disturbance of pigment epithelium. H, or HAH = 1 D. O. S. presents a similar appearance except that the disc is vertical oval and is slightly paler than in O. D. With a red glass before O. D. the right image is seen above the left and tilted towards it. The two images are fused by 25° prism base up before O. D. and

3° prism up base out. By throwing the head backward he could bring the images together without any prism. The palpebral fissures are almost equal in the two eyes, but the edge of the right lower lid is $6\frac{1}{2}$ or 7 mm. below the left and of the right upper lid $5\frac{1}{2}$ or 6 mm. below the left. When the eye lids are closed the right eye is sunken $2\frac{1}{2}$ or 3 mm. as compared with the left. As the patient looks downward the upper edges of the cornea are about on the same level, when he looks straight ahead there is a difference in level between the eyes amounting to $2\frac{1}{2}$ to 3 mm. which difference is increased to 5 mm. when he looks upward as far as possible.

As the last visit, eight months after the accident, the condition was about the same except that the diplopia was not so great and was overcome by a 12° prism. The diplopia annoyed him in the street, but very little at his work when he is obliged to look downward.

A CASE OF RUPTURE OF THE CHOROID COAT.

By E. C. ELLETT, M. D.

Memphis, Tenn.

Ophthalmic and Aural Surgeon to St. Joseph's Hospital, and to The Children's Home, Memphis, Tenn. Formerly House Surgeon to the Wills' Eye Hospital, Philadelphia.

ILLUSTRATED.

On February the 10th, 1897, Mr. E. was sent to me by his physician, Dr. S. C. Sims, of this city, on account of an injury to his left eye. Two weeks before seeing me he had been struck in the eye by a stick and became at once blind. He received no treatment at all.

I found vision $\frac{20}{30}$ in O. D. and fingers at six inches in O. S. He is a railroad employee, and was recently examined as to vision, and knows his sight was good before the accident. The left pupil was half dilated and fixed. In the cornea two opaque lines ran from the corneal center parallel to each other, down and out to the limbus. The epithelium was intact. The eye was sensitive to light, but not otherwise painful. The pupil, as I stated, was immovable to light or mydriatics.

The right eye was normal.

In the left eye, the fundus details were obscured by a vitreous haze, but I could make out no opacities of vitreous or lens. The nerve was a little paler than in the right eye; the vessels were normal. One and a quarter disk diameters out from the disk, and below a line drawn from the disk to the macula, was a pale area (which would probably be white, except for an obscuration of the whole fundus), with sharp borders, about one disk diameter long (vertically), comma shaped, with its temporal side curved not quite so sharply as the disk edges and crossed by an intact twig of the descending temporal vein. The big end of this figure was down. The upper (small) end was the width of a retinal vein, tapering to a point. The big (lower) end was three vessels wide. Between this and the macula, and $\frac{1}{2}$ disk diameter from the above described area, was a second vertical white streak, sharply limited on both sides by a very narrow line of pigment. This faded away above (1 disk diameter above the macula level). Followed down it was seen to be an arm of a similar broader area below whose other arm went up

outside the macula, it (the macula) being in the fork between the two. The lower broad area started indistinctly, from a whitish (oedematous) area about the inferior temporal vein, becoming well marked as it came upward. As stated, it divided below the macula into two arms. The nasal arm has already been described,



and is about two retinal vessels wide. The temporal arm is the most conspicuous feature of the eye ground. It is three vessels wide, sharply defined in most of its extent, with a fine pigment border more marked on the nasal side. One disk diameter up and out from the macula it lost its pigmented border, and at this point was crossed by an intact branch of the ascending temporal vein. From this point it ascended, curving inward, beyond the trunk of the ascending temporal vein. The fact that the retinal vessels crossed these white arms locates them in the chorioid coat. The whitish (oedematous) area of the descending temporal vein began just below the comma shaped break, and extended outward beyond the field. All the breaks were curved toward the disk, as it is characteristic of chorioidal ruptures.

In the few days I had him under observation, the vision improved to $\frac{10}{200}$.

The vitreous haze I take to be what was left from a vitreous hemorrhage, for, though no other evidence of it was present at the time I saw him, this usually ac-

companies rupture of the chnrioid. I gave a bad prognosis on account of the proximity of the break to the macula.

I submit this case and the accompanying cut without comment, as a typical instance of this lesion. No active treatment is indicated, but an astonishing improvement often follows rest and sedative treatment.

A NEW TENOTOMY SCISSORS—A MODIFICATION OF DR. STEVENS' INSTRUMENT.

By **CASSIUS D. WESCOTT, M. D.**,

Instructor in Ophthalmology at Rush Medical College, etc., Chicago.

Ever since Dr. George T. Stevens of New York city gave us the beautiful instruments comprising his tenotomy set, I have used his delicate scissors in all operations on the muscles, in some iridectomies and in other operations where delicately pointed scissors were called for.

At first the Stevens instrument seemed to be all that could be desired, but some time ago it occurred to me that the modification so well shown in the accompanying cut would make the instrument still more delicate and easier of manipulation in certain positions. Practical use of the new scissors, which have been made for me by Mr. Meyero-witz of New York, has convinced me that they will also be found useful by my colleagues. I have been pleased to find that I can use this instrument almost as well with one hand as with the other, although I have always found it very awkward to use an ordinary pair of scissors with the left hand.



One of my friends has suggested that the scissors would be better made with the aseptic lock. The instrument maker, however, advised the ordinary screw as being much more secure and feared that with the delicate spring handles the scissors would not be satisfactory if made with the French lock. Another friend has suggested that the springs be made a little fuller and broader and that the corrugations be continued further from the lock in order to give a more secure grasp. These and other modifications can easily be made to suit individual preferences, but I find the present form very satisfactory.

31 Washington St.

NOTE.—Dr. Wescott has kindly sent me a pair of his new scissors, which for delicate work are to be recommended as preferable even to the Stevens scissors, for the reason that the shape of the instrument allows it to be held in the manner of a pen, which is a distinct advantage.

WURDEMAN.

SO-CALLED ACCOMMODATION IN THE LENLESS EYE —WITH REPORT OF A CASE.

By JOSEPH A. WHITE, A. M. M. D.

Professor of Diseases of the Eye in the University College of Medicine, Richmond, Va.

Whilst the question of so-called accommodation in Aphakial Eyes is a mooted one among leading authorities, there is no doubt but that an occasional case is met with that brings to the fore the consideration of this unsettled subject. Whether it is a species of accommodation, or a peculiar ability to interpret dispersion circles or whatever the explanation may be, there are individuals on record, who, with a lensless eye, have had the power of seeing distinctly with *the same glass* at all distances within the normal range of vision. The number of such cases, especially those subjected to the proper tests, is of course not very great, and I may therefore be pardoned in considering the one I now present as somewhat remarkable and worthy of going on record.

J. A. F., forty-five years of age, blind in the right eye with cataract but had the left lens removed four years ago. The Astigmometer showed about 2 or $2\frac{1}{4}$ D. of astigmatism against rule. His vision was $\frac{3}{16}$ with + 12 D. \odot + 1.5 Dc ax 180° , and with the same glass he read No. 1. Jaeger at 10 to 12 inches without moving the spectacles or tilting his head. At intermediate points his vision agreed with this result i. e. V. = $\frac{1}{10}$, — $\frac{6}{8}$, etc.

With + 11 D. \odot + 1.5 Dc ax. 180° his V. = $\frac{3}{15}$, and with + 13 D. \odot 1.5 Dc ax 180° he could read No. 1. nearer and more sharply. The radius of corneal curvature with central fixation was in the horizontal meridian—7.30 mm, and in the vertical meridian 7.70 mm. When fixing an object at 20 ft. the radius of curvature was in H. M., 7.33 mm, and in V. M., 7.75 mm. When he attempted to decipher some letters on a small disk fastened by a wire to the tube, the radius of curvature in the H. M., was 7.20 mm, and in the V. M., 7.65 mm. That there was a change in the shape of the cornea was shown by displacement of the images on the arc.

With the eye cocainized and held open artificially these results were the same.

As he had already conformed to one of Donder's requirements for accommodation (see Donder's "Accom. and Refract." p. 320) that the result of the equation for vision at different intervals between near and distant points should correspond, I tried him also with the light point test, but whilst agreeing in the main, his replies were somewhat unsatisfactory.

The following day the pupil was dilated ad maximum, exposing a densely clouded capsule with one small central triangular opening and one round opening in the upper and outer quadrant; this latter was covered when the pupil was contracted. The visual result was as follows:—

With + 10 D. \odot + 2.25 Dc ax. 180° V. = $\frac{3}{15}$

" + 13 D. \odot + 2.25 Dc ax. 180° he could read No. 1.

With $+ 11$ D and the cylinder he could not get $\frac{2}{20}$; nor could he read No. 1. with any weaker glass than $+ 13$ D added to the cylinder, showing that whatever his power of accurate vision for different distances might have been, it was considerably altered by the mydriatic; this alteration being equal to at least 3 D. The manifest astigmatism was also changed from $+ 1.5$ D to $+ 2.25$ D under the mydriatic.

It seemed strange that before the use of the mydriatic he obtained $\frac{2}{20}$ with $+ 11$ D $\bigcirc + 1.5$ Dc ax 180° , whilst afterwards he could get the same result only with $+ 10$ D $\bigcirc + 2.25$ Dc ax 180° . This reduction of nearly 1 D in the spherical whilst under the influence of the mydriatic seems contrary to all rules, although the increase in the strength of the cylinder in almost equal amount (in other words, the manifesting of some latent astigmatism) is in accordance with common experience. A possible explanation of this decrease in the spherical glass is that prior to the instillation of the mydriatic more or less spasm of the ciliary muscle existed.

If a lens were in the eye, this would have resulted in drawing forward the choroid, relaxing the suspensory ligament and producing an apparent refractive myopia which would have disappeared under a mydriatic. In the absence of the lens, however, the effect would be to draw forward the choroid and possibly shorten the antero-posterior axis, producing thereby slight hyperopia. When the ciliary muscle was relaxed by the mydriatic, the traction on the choroid would cease and slight elongation of the antero-posterior axis result with a consequent decrease in the strength of the lens.

With the pupils dilated, the radius of corneal curvature in the H. M., was 7.20 mm, and in the V. M., was 7.65 mm when he attempted to fix near objects; whilst it was in the H. M., 7.33 mm, and in the V. M., 7.75 when looking the a distance, Here again the displacement of the images on the arc showed that the corneal curvature was changed.

Neither before nor after the use of the mydriatic was the alteration in the corneal curvature more than 0.75, and it was evidently produced by the action of the external muscles in the effort to accommodate for near vision. These results were the same in every examination which was repeated every day for several days.

It will be observed that the radius of curvature in the two principal meridians of the cornea were practically the same for near points and also for distant points both with a contracted and dilated pupil. This does not correspond with what theoretically should have been the case when the difference in the astigmatism with and without the mydri-

atic is taken into consideration. I am therefore puzzled to account for the 0.50 or 0.75 of astigmatism which became manifest when the pupil was dilated and again became latent upon its subsequent contraction. I am also at a loss to explain the difference in his so-called accommodation power before and after using the mydriatic, which difference amounted to 3 diopters. As soon as the pupil contracted this focusing power was restored. Woinow's view that this might be brought about by an alteration in the curvature of the anterior surface of the vitreous by the action of the ciliary muscle is scarcely tenable, as the effect of this muscle's action would be rather to draw the whole vitreous forward as above suggested without altering its anterior surface at all. That it is not due to the change in the cornea, according to Foerster's view, is evident from the fact that this alteration was the same both with and without the myriatic.

If we accepted Loring's view, that the so-called accommodation in the lensless eye is explained by *individual ability to interpret dispersion circles*, we have a plausible explanation of the loss of this ability when the pupil was dilated, as the dispersion circles are thereby very much increased and consequently more difficult to interpret.

I should, however, suppose that the opaque capsule with central opening would have compensated to some extent for the dilation of the pupil in any confusion that might have arisen from the increase in size of the dispersion circles, unless the presence of the second opening caused two sets of dispersion circles overlapping each other just as monocular diplopia results from two openings in the iris. This of course would cause as much interference if not more with the power of interpretation of dispersion circles than if the pupil were perfectly free from membrane; and this may explain why this case differs from all those I am familiar with in our literature *in the apparent loss of the so-called accommodation* when under the influence of a mydriatic.

Loring's view has been very ably supported by Dr. E. A. Davis in his article on accommodation in a lensless eye published in the *Manhattan Eye and Ear Hospital reports* Jan. 1895. Sillex in his paper in *Knapp's Archives* in 1888 drew the same conclusion. It is probably the most satisfactory explanation heretofore submitted, but why is it that so few of the multitude of cataract cases require this power? And is it optical or mental.

CORRESPONDENCE.

EDITOR OF THE OPHTHALMIC RECORD:

My attention has recently been called to an editorial in the July number of the OPHTHALMIC RECORD, under the title of "Empiricism in Ophthalmology," in which a paper presented by me at the St. Louis meeting of the Western Ophthalmological, Otological, Laryngological and Rhinological Association, entitled "The Value of Weak Lenses in Moderate Errors of Refraction," comes in for criticism along with the paper by Dr. Gradle, on "Asthenopia Not Due to Refractive Errors," read at the January meeting of the Chicago Ophthalmological Society.

I am not aware of any ambiguity in the title of my paper, and replying to the criticism of the RECORD would say that the paper, as indicated by the title, was directed to the subject of errors of refraction, and not to heterophoria. I did not deem it necessary to state that my routine examinations of eye cases includes tests with the phorometer, examination with ophthalmoscope, and inspection of the nasal mucous membrane, as well as tests with lenses before and after suspension of accommodation.

I might have complicated my paper by referring to many of the causes of asthenopia, including inequalities of muscle balance, which I not only recognize as a fruitful source of trouble but consider second in importance to refractive errors. The paper, however, was intended to call attention to the fact that *moderate* errors of refraction *alone* are frequently the cause of asthenopia in a certain class of patients, and that these must not be overlooked or go uncorrected (contrary to opinions expressed by some of our prominent ophthalmologists) if we are to secure the practical results which our patients desire.

Very truly yours,

ALBERT E. BULSON, JR.

21 Pixley-Long Building, Fort Wayne, Indiana.

REVIEWS.

Treatment of Toxic Amblyopia (Retro-bulbar Neuritis) by Injections of Serum.—Dr. de Wecker, of Paris (*Annales d' Oculistique*, June, 1897), calls the attention of the profession to the treatment of retro-bulbar neuritis by serum-therapy. In the first place, he holds that toxic amblyopia at the beginning resembles, perfectly, the true infectious forms of retro-bulbar neuritis. While he considers that toxic amblyopia and the consecutive trophic troubles of the optic nerve result from a toxic element in the blood and lymph impregnated by injurious principles introduced into the organism by way of the stomach, by inhalation, or by cutaneous absorption; while he attributes the deleterious action to an excessive accumulation of toxic elements due to retention because of defective renal or cutaneous excretion, still he thinks that in true retro-bulbar neuritis it is a question, rather, of infection of the trunk of the optic nerve, more or less direct. Here the infectious element arises from the vicinity of the nerve and from the cavities of the cranial bones. It is the diverse varieties of inflammation of the sinuses, of rhinitis, of affections of the middle ear and those of the cranial cavity which in general play a preponderant rôle.

It is certain that, at the beginning, the functional troubles and anatomical changes are identical, whether the trophic alterations are produced by toxines carried in the circulation in general, or by infections, more or less direct, coming from the vicinity of the optic nerve. A clear differentiation is only established by the course taken by the toxic amblyopia, which remains more or less stationary and limited to the region of the macular fibers of the nerve, while the true retro-bulbar neuritis, caused by infection and propagation of other inflammations, soon leaves the circumscribed region of macular fibers and invades the surrounding fibers, and becoming generalized, frequently ends in a complete abolition of the conductivity of the nerve.

Following these preliminary statements, which appear to him useful in explanation of his therapeutics and to indicate why he has been led to the use of serum-therapy in toxic amblyopia, he says that no one denies the presence of toxines introduced into the circulation by alcoholic or nicotine poisoning, or of those due to oxide or to sulphide of carbon, or to lead, or to quinine, or simply to retention of

elements, such as are produced by diabetes, albuminuria, uremia, etc. For these, two methods of treatment have heretofore been tried, viz., that of elimination by stimulating the excretions and secretions, and that of introducing into the circulation antitoxic antidotes appropriate to each case. The first, is often of little efficacy, and is very slow. Besides, it is many times rendered impracticable by reason of the feeble condition of the patient. The second method encounters this obstacle that we do not possess for each kind of toxine the potent antidote, and even when an antitoxic is really at command, its introduction into the circulation in sufficient quantity is hazardous.

Who has not been struck by the marvellous results obtained by the introduction into the veins or into the subcutaneous tissue of large quantities of serum in cases of pyemia and of septicemia, saving from death sufferers whose blood held toxins in abundance? Do not these "washings" demonstrate the possibility of eliminating from the blood- and lymph-current in a very short space of time the most pernicious, infectious elements? It was logical, therefore, to believe that, if such is the power of these "washings" over the most pernicious principles, which had rapidly impregnated, *en masse*, the circulation, one might be able so much the better to eliminate from the organism less violently toxic substances which were directing their action, preferably, upon the sensitive peripheric nerves. The demonstration of the accuracy of this reasoning was soon made by a series of injections of serum used especially on those affected by alcoholics. This method proved rapidly efficacious.

Not having at his disposal a hospital service, de Wecker was forced to resort to a particular kind of serum injections. Properly speaking, he has not made any true "washings" of the blood by injecting litres of the liquid, and has abstained from any intravenous injections. The injections were generally limited to 60, 80 and 100 grams a day, but, exceptionally, they were increased to 150 or 200 grams. These greatly exceed in volume the simply *stimulating* injections of serum-therapy, and as the aim was principally to obtain an antitoxic action, recourse was had by preference to a "rich serum." That of Chéron was used, which contains in 100 parts, 1 of the crystals of phenic acid, 2 of chloride of sodium, 8 of sulphate of soda, and 4 of phosphate of soda. While Chéron only injects, every two or three days, 5 to 10 grams of his solution in the trochanteric region in combatting grave asthenia, de Wecker has begun with 50 and 60 grams and has sometimes gone up to 200 grams. Chéron is of the opinion

that the injections may be increased to an amount containing 2 gr. 20 centigr. of phenic acid at a single time without producing the least trouble or without finding phenic acid in the urine. De Wecker thinks that the injections ought not to exceed 100 c.c., and the most rigorous asepsis should be observed in regard to the skin, needles, injection-liquid, and receptacles. The dose of this size tends less to a "washing" of the blood than to its "disintoxication." The injections should be made very slowly to avoid pain, ten to fifteen minutes being consumed in using 60 to 100 grams, and the liquid should be warmed to 35° to 38° . In cold weather, care should be taken to cover with warm towels the swelling of the skin of the abdominal region.

The treatment has the inconvenience of consuming much time, and of the disappearance of the patient before being entirely cured, by reason of the rapid improvement of vision, this often rising in a few days from $\frac{1}{10}$ or even $\frac{1}{20}$ to $\frac{1}{4}$ or $\frac{1}{3}$. He is then able to busy himself again and prefers to avoid the disagreeable treatment.

In true retro-bulbar neuritis of an infectious origin and arising from the neighboring parts, or developing, by the propagation of other inflammatory processes, or when another kind of beginning atrophy is mistaken for it, these injections are absolutely without effect. But in the true toxic form, the result is so prompt that the patients themselves are not slow to call attention to their increased visual acuity. The whole medication, in brief, consists in abstaining from tobacco, substituting milk for all fermented drink, and using the serum injections. Serum-therapy is also so prompt in its action in toxic amblyopia that it, in a way, serves to establish a diagnosis.

HUBBELL.

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EDITORIALS.

OPHTHALMIA NEONATORUM.

Much emphasis has heretofore been laid upon the proper treatment of ophthalmia neonatorum, and in several states laws have been enacted requiring nurses and midwives to report to a physician the earliest symptoms of the disease, the violation of which is subject to severe penalty. This is most commendable, inasmuch as many eyes are saved by the physician that would be lost by neglect or improper treatment. But it has now been proved, undoubtedly beyond question, that the disease may be prevented almost or quite entirely by the adoption of certain measures at the time of birth; and for some years the writer has urged that it is as much more necessary to use the preventive treatment here, as the benefits of prevention are superior to those of cure. Not that curative treatment is to be belittled, but that there should be as little use for curative treatment as possible. Like smallpox, typhoid fever or tuberculosis, it must be properly treated when it arises; but it is infinitely more important to render its causes inoperative or to check their diffusion. In this disease, as in others, the employment of any known preventive becomes, indeed, imperative.

It is gratifying to witness the action of the American Medical Association, through its ophthalmological section, at its recent semi-centennial meeting in Philadelphia, in endorsing, at least in part, the idea of the preventive treatment of ophthalmia neonatorum. Resolutions were adopted to the effect "*that we desire to call the attention of obstetricians to the fact that these cases are unfortunately common in our practice, and to urge the more frequent use of silver nitrate solution in the manner described by Crede,*" and "*that we approve of legislation which would result in the invariable use of this method in public institutions, or of any other equally safe and efficient method, whereby the loss of vision from this disease would be lessened.*" Preventive treatment is here

recognized, both in admitting its benefits and in recommending its use. But the resolutions fall very short of expressing the requirements which such a recognition implies. If prevention be effective, it should be exercised wherever the victims of the disease are to be found and in such a manner as to include the greatest number of those exposed to its causes. At the present time most public institutions adopt some method of preventing it, and the number of cases in them is reduced to a minimum. And yet the resolutions "approve of legislation which would result in the invariable use," here, of Cr  d  's or some other method. On the other hand, there is little or no reduction in the frequency of the disease in private practice, and its ravages go on unabated, notwithstanding, too, the efforts by legislation to secure proper curative treatment; but the resolutions simply "call the attention of obstetricians to the fact that these cases are unfortunately common," and "urge the more frequent use" of Cr  d  's method. It seems to us that the resolutions, as thus expressed, are inconsistent with the situation and that the emphasis is put in the wrong place.

If there be measures which prevent the development of this disease, they should not be limited to "*more frequent use*," but should be *generally used*. If they be effective in public institutions, and be worthy of enforced practice there, they are equally so in private practice. If they should be "invariably" used in the former, for the same reason they should be, in the latter.

The contention is often made that the majority of cases are not infected, and do not, therefore, require the application of preventive measures. This may be true, and it would hold good were it possible for the midwife, nurse or even the physician to recognize the infected cases and separate them from the non-infected. But all obstetricians and ophthalmologists know this cannot always be done. Further objection to the general use of preventive treatment might be raised, if it were difficult to apply it or if it were harmful in its effects. But this is not the case. There is no valid reason, whatever, why the rule should not prevail, *that some method*, and at the present time Cr  d  's seems to be the most simple, universally applicable, and efficient, *should be applied by every person officiating at the parturient bed-side, and that it should be done to the eyes of every living infant at the time of birth as universally as is the ligature applied to the umbilical cord or the first bath to the body*. It is only by much practice that every infected case, even though among the few, can be included, and the great majority which are non-infected, do not suffer harm thereby.

Whether or not it be possible to enact laws to enforce the practice of treatment to prevent ophthalmia neonatorum, it is certainly true that the time is not far distant when, unless the efficacy of such treatment be disproved, the obstetrician will be deemed guilty of neglect and malpractice in a case of the disease where he has failed to apply it. The practice must, therefore, sooner or later be observed,—sooner if promoted by legislation, later, if left alone to conquer professional and public sentiment by virtue of its inherent potency.

A. A. H.

THE PERFORATED AND NON-PERFORATED ARTIFICIAL EYES.

Until recently we have had only the non-perforated artificial eyes. It is clear to us now that there have always been two objections to wearing these, both depending, however, on the same cause. In the first place the air enclosed behind the non-perforated artificial eye soon becoming absorbed reduced the pressure on the blood vessels behind so that they soon become congested. This congestion excited secretion, hence the necessity of the frequent taking out and cleansing of the artificial eye; in the second place it is well known that not infrequently the non-perforated artificial eye breaks while in the orbital cavity. It is not unreasonable to conclude that the breaking is due to the atmospheric pressure without, there being a partial vacuum behind the eye. Both these objections to the non-perforated eye seem to be entirely overcome by the perforated eye, which has been recently introduced into ophthalmic practice by Dr. Schwenk, of Philadelphia. The perforations are made one at the outer canthus and one at the inner canthus, in, or almost in, the horizontal meridian and sufficiently far removed from the corneal margin as not to attract attention. Through these perforations the air enters and thus the formation of a vacuum by absorption is prevented. The blood vessels having the normal atmospheric pressure should not become congested and the mucus membrane should not be excited into excessive secretion. By means of these perforations the pressure is kept practically the same on both sides of the eye shell, hence there ought to be no breakage from external atmospheric pressure. These two advantages in favor of the perforated eye, in my judgement, are not imaginary. At this writing we are trying some of them and trust soon to be able to report that the advantages are real.

G. C. S.

EYE AND EAR EXAMINATIONS FOR RAILROADS,
STREET CARS, ETC., ETC.

Quoting freely from Dr. Wm. Thomson's admirable chapter on the "Detection of Color Blindness" in the second volume of Norris and Oliver's "System of Diseases of the Eye," Dr. Thompson asserts that there are in this country 180,955 miles of railroads giving employment to about one million men. This statement is a sufficient argument for the plea that railroads be operated with as little risk as possible to the millions of passengers annually carried. It is not desirable to injudiciously inflict hardships upon corporations that frequently run their roads at a loss, but if they voluntarily assume to carry trains through cities and to transport people and property, certain elementary requirements should rest upon them as State or United States obligations.

Without going into this subject fully, with its multitudinous ramifications, the writer ventures the assertion that those employees immediately concerned in operating trains, should at least be compelled to be in full possession of good sight and hearing. This refers especially to those handling the engine, viz., the engineers and firemen; but should also apply to the conductors, brakemen, switchmen and bridgemen.

It is surely not asking too much for the corporations to compel such employees to have good sight and hearing, considering the rate of speed frequently attained, and the heavy responsibilities voluntarily assumed. Even railroad officials who have thus far taken no steps in this direction cannot evade the justice of this simple claim. Their only excuse for inaction consists in criminal carelessness or impecuniosity.

Dr. Thomson in correspondence with roads operating 129,970 miles, found that thirty-five roads, operating 54,465 miles, used *some* system to ascertain the ocular and aural condition of its employees; thirty-two roads, operating 29,428 miles, took *no* precautions in this direction; while thirty-four roads, operating 46,077 miles, made no reply to his letters of inquiry, thus leaving themselves open to well grounded suspicion. Thus it will be seen that many thousand miles of railroads are operated under a system which takes no precaution to ascertain the ocular and aural condition of *even their locomotive engineers*.

This is appalling, but no more so than the apparent influence possessed by railroad corporations over our Legislatures, as evidenced

by the fact that notwithstanding frequent attempts have been made at the passage of benign laws, thus far, only three states, Ohio, Massachusetts and Alabama, have enacted restraining laws in this direction, and such laws are only properly carried out in Alabama. The writer believes that concerted action on the part of medical men, would induce railroads to remove opposition to the passage of plain, untechnical and simple laws, requiring and controlling such examinations, and that such objections once removed, our Legislatures would be glad to carry out such legislation. Action should be taken upon this subject by the American Medical Association, in order to obtain the effect of its endorsement.

Such examinations by specialists have been envired by too much apparent mystery and detail to popularize them with railroad officials and employees. The elaboration of a technical and lengthy examination necessarily involves a considerable fee. Such an examination, while perfectly comprehensible to most ophthalmologists, appears exceedingly mazy and unnecessarily complicated to a layman, and discourages him at the outset.

The writer believes that, at present, at least, such examinations by medical men, should involve the ascertaining of simple and essential facts, in the quickest and most primitive manner consistent with a reasonable regard for scientific accuracy. Perhaps later, when the laity is brought by degrees to a higher standard, more accurate examinations will be generally possible. What practical railroad men want to know is, can the individual see properly, hear properly, and distinguish colors properly? The writer from considerable experience believes that these facts can be ascertained with reasonable accuracy, and a simple comprehensive certificate (previously partially printed) made out in favorable cases, in five minutes.

If this is true and a contract for the examination of a large number of men entered into between the road and the ophthalmic surgeon, then a fee of one or two dollars per capitum, should cover the expense. Simplicity, practicability and inexpensiveness thus combined, the roads will be found more amenable to argument than where the reverse of these conditions prevail. Another convincing argument to railroad officials will be that of *actual economy*. It is often necessary to spend money, in order to save it, and this is the case in the issue at present involved. To say nothing of defective vision and hearing, when we consider that the percentage of color-blindness in males is between 3 per cent. and 4 per cent., which would produce between 30,000 and

40,000 color-blind men among the one million railroad employees in this country, we can form an idea of the enormity of this condition, even though some roads have eliminated their own percentage of color-blindness by proper ophthalmic examinations. Add to this the thousands of employees with defective vision and hearing, and it will be found that railroads are fostering in their employ an enormous element capable of leading them into much trouble, litigation and expense, to say nothing of remorse, over lives lost from the employment of, perhaps, a color-blind locomotive engineer.

The consequences of *one accident* might easily pay for the examination of every employee on a particular system. The writer is himself cognizant of a certain notable case where an accident caused by an engineer with defective vision, cost the road nearly one hundred times what it subsequently cost the company to have the eyes and ears of its employees examined by an ophthalmic surgeon.

Besides this it is hardly necessary to remind railroad officials that in case of accidents involving litigation, where questions of eye-sight, color-sense or hearing are involved, a certificate from a reputable ophthalmic surgeon will possess more weight with a judge and jury, than no certificate at all, or one from some unprofessional employee, such, for instance, as a section superintendent. It will impress the court favorably to know that a railroad has been sufficiently observant of the welfare of the public, to compel such examinations, and a railroad may often be placed in a position *after it gets into trouble*, where it would be glad to pay a large sum, if it had only had the precaution to have on file certificates of ocular and aural health. But *then* it will be too late. It is like insurance. It must be taken out *before* fire or death. Railroads will spend fortunes to guard against trouble, but usually neglect to *surely* ascertain if the man, who drives a train, which perhaps carries thousands of lives, can see properly, hear properly, and distinguish signals properly, which could be done, at very small expense.

Some ultra practical railroad men say, that defects of the eye and ear become quickly self-apparent, and before a man advances to the responsible post of engineer, he will show himself unfit for such a position, and will either be dropped by the company, or will voluntarily resign, through a personal sense of inability to properly perform his duties. The great army of defectives in railroad service detected under the ophthalmic and aural examinations instituted by some roads, is an answer to the first part of this argument, and the

mere fact that defective men have been able, by tact and ingenuity, to progress to high positions of trust, is no argument against the necessity of high grade eyes and ears in such employees. The optimism conveyed in the second part of this argument, implying that men cognizant of their own defects will voluntarily resign, while beautiful to contemplate, is found absolutely untenable in practice. The writer has examined many hundred railroad employees, and has never found a man willing to admit a defect, or, after such a defect had been unmistakably demonstrated, willing to give up his job, even though he must see that he retains it at great risk to himself, his company, and the lives and property of the public. Therefore, it is unfeasible to trust to the men themselves to voluntarily resign their positions, when impaired senses become evident. They will hardly do so, until they become stone blind and deaf.

Many officials, whose employees are examined (?) by some railroad man, such as a section superintendent, and who conscientiously feel that this is sufficient, will scoff at the suggestion that such examinations be made by an ophthalmic surgeon, and feel that arguments advanced therefor are made from business motives. The writer desires to state that examinations of this nature, made by unprofessional men, whose work is merely automatic and stereotyped, who can give no reason for anything, and who must, by close association with employees, become more or less sympathetically biased for or against them, are absolutely worthless, nay more, they are worse than worthless; they are *injurious*, because they engender a sense of unjustifiable security. The writer does not mean to say that defects are never detected under this system. Such a statement would, of course, be untrue. But that it *frequently* passes favorably upon applicants, who are conspicuously defective, cannot be questioned.

The writer has recently examined two hundred and twenty motormen, who have never before undergone any kind of an official examination. The company only required in *old* employees, normal vision in one eye, with or without glasses. This was surely sufficiently lax.

Seven men were found to possess noticeably defective vision, correctible by glasses. One man's vision was 20-40 and 20-50, another the same, another 20-60 and 20-60, another 20-100 and 20-100, another 20-100 and 20-60, another 20-60 and 20-60, and another 20-70 and 20-70.

Five men were found with noticeably poor vision, uncorrectible by glasses. One man's vision was 20-60 and 20-200, another 20-200 and

20-200, another 20-50 and 20-200 (conical cornea), another 20-50 and 20-50, and another 20-60 and 20-100.

Only one color-blind man was found, and no one was found possessing noticeably poor hearing. These figures are given to show the general condition of unexamined men, running cars through our crowded city streets.

The writer has also recently examined one hundred and fifty-one locomotive engineers and firemen, *who have undergone the regular railroad eye and ear examination by an unprofessional man, and who were supposed to be in practically perfect condition.* The company desired leniency to *old* employees, so nearly the same standard was adopted as in the previous examinations, viz., perfect vision in one eye and $\frac{3}{8}$ in the other was required.

Six men were found with insufficient vision, all of whom could, however, pass a satisfactory test for glasses, fitted by the writer. One man had a vision of 20-60 and 20-70, another 20-40 and 20-40, another 20-70 and 20-40, another 20-100 and 20-200 (*had been an engineer for twenty years, and NEVER had better vision*), another 20-100 and 20-100, and another 20-70 and 20-30. Four men were found who were distinctly color-blind, and all had good hearing.

Fancy some of these men running an engine, and imagine what the average railroad examinations for eyes must be, to have passed favorably on them. These facts are mentioned to emphasize the claim that not only should railroads be required to have the eyes and ears of their employees examined, but also that such examinations should be conducted by *Ophthalmic and Aural Surgeons.*

What has been said applies also to street car companies, and companies operating all kind of boats, bridges, etc.

ALLPORT.

REPORTS OF SOCIETIES.

REPORT OF THE PROCEEDINGS OF THE SECTION OF
OPHTHALMOLOGY OF THE BRITISH MEDICAL ASSO-
CIATION; 65TH ANNUAL MEETING; MONTREAL
CANADA, AUGUST 31 TO SEPTEMBER 4, 1897.
REPORTED FOR THE OPHTHALMIC RECORD.

By H. V. WÜRDEMAN, M. D.

Of Milwaukee

The meeting of the Section of Ophthalmology of the British Medical Association was held in the lecture room of the McDonald Engineering Building of the McGill University, being called to order by the president, Edward Nettleship, F.R.C.S., of London. Vice-Presidents: F. Buller, M. D., Montreal; R. A. Reeve, M. D., Toronto. Ed. Desjardins, M.D., Montreal; A. A. Foucher, M.D., Montreal. Honorary Secretaries: W. H. Smith, M.D., Winnipeg; J. Jehin-Prume, M.D.; Montreal; T. H. Bickerton, M.R.C.S., Liverpool.

Before the formal business of the Section was taken up, Buller of Montreal, showed the case of a boy whose eye had been penetrated by a buckshot two weeks before, the sight being totally destroyed and the eye-ball soft and filled with blood. Two weeks previous he had performed Mules' operation, and the patient was wearing an artificial eye. The result was good although excursion outward and upward was not normal.

The President expressed his appreciation of the honor conferred upon him by his election as chairman of the Section, and then gave general directions regarding its conduct. He referred to this being an important event and an historic meeting. Each paper was to be limited to 15 minutes, and discussions thereon not more than 5 minutes.

Discussion on Antisepsis in Eye Surgery.—Noyes of New York opened this discussion describing the methods used by himself and colleagues in hospital practice in securing ocular asepsis. This has to be modified according to circumstances in private practice. The patient receives a full bath and clean clothing. The eye is sometimes placed under an occlusive bandage for 24 hours before the operation in order to thereby find out whether any latent conjunctival disease may be lighted up. If such be the case the operation is deferred until the irritation is subdued. Preliminary to the operation the face and head is thoroughly cleaned; the eye-brows especially receive attention; the eye-lids and all the parts surrounding the eye

by soap and water ; then the more particular preparation of the conjunctival sac is made by washing with simple solution of boric acid which is an antiseptic application which washes out the mucus hidden away in the cul de sac. The instruments are placed in boiling water, remaining not longer than 5 or 10 minutes ; they are then immersed in 4% carbolic acid solution. Needles and knives are not boiled, but are wiped clean with alcohol and absorbent cotton ; great care is used in the examination, by a magnifying glass, of jointed instruments ; in some instances when called upon to operate outside of the hospital he has not been able to boil the instruments. Then they are immediately before the operation, immersed in alcohol and kept there for a period of 10 or 15 minutes. So far as the operator himself is concerned, his fingers need not necessarily come in contact with the eye, and so his hands are cleansed by warm water and soap. The nails are scrubbed with a brush to remove all the fetid matter under them, which renders them sufficiently immune for practical purposes. The dressings are thoroughly sterilized. The lint bandages have been subjected to steam heat in a suitable apparatus, and been put away in a glass jar with a tight cover, and only opened as occasion requires. The bandages, lint and other such material, have been carefully kept from the air after having been treated. After an operation which involves the opening of the cornea the same method is necessary for the solutions used in dropping, atropin, cocain, eserin, etc., which are made especially for every operation and used only once. It is not the dipping of a dropper in a bottle that has been opened several times but each should be carefully prepared for the purpose. Dressings, already sterilized, cotton or lint wet with bichlorid of mercury 1:3000 applied. If it is desired to keep the eye moist, gutta percha tissue may be put on over the dressings. In cleansing the anterior chamber for simple cataract, the debris which may have been collected is washed away by boric acid solution by a bulb, simply to wash away the material from the exterior of the wound, but he has long since given up the washing out of the anterior chamber. Especially has he given up the iodid of mercury because he found that it gave rise to opacity of the exterior surface of the cornea in some instances or other unpleasant conditions, and he no longer resorts to any form of injection into the anterior chamber. For the preparation of the conjunctival sac he orders 2% boric acid or salt solution, for the simple removal of the mucus, etc., which is in the sac. Two instances have been noticed where after operation involving the cornea suppuration has occurred

in which the operations were done under the worst sanitary aspects, there being foul water closets in the immediate neighborhood of the patient. This emphasizes the fact that operations in private houses are far less advantageous than those in properly fitted institutions. It is well known that all the more serious dangers proceed from suppuration or disease of the lachrymal sac, which may be latent and developed through the bandaging, etc. He re-called a case in which the eyes and nasal passages were apparently normal, but on the fifth day after operation infection occurred from a suppuration arising at that time in the lachrymal sac which had hitherto been healthy, but in which a latent process must have existed for years. He prefers moist dressings to the dry, as they continue the disinfection of the eye-lids and serve as a splint. It is well to look at the condition of the eye-lids after 24 hours.

Randolph, of Baltimore, said: It seems certain that our ideas on the subject of antiseptics in eye surgery have undergone revision in the last few years. Sublimat no longer holds the place it once held as a germicide, for in the strength necessary to kill the conjunctival bacteria it is a decided irritant, and even in the strength usually employed by the ophthalmologist (1:5000 or 10:000) it is not entirely free of irritating properties. Boric acid solutions while not so irritating are of very doubtful antiseptic value. We know then of no antiseptic which is non-irritating, and has at the same time the power of destroying the conjunctival bacteria. The successful operator who has made it a habit of late years to irrigate the conjunctiva can not justly attribute his increased success to this step (for he has certainly not succeeded in disinfecting the conjunctiva) but rather to a better understanding of the principles of asepsis as applied to his cocaine, hands and instruments. For sterilizing instruments, cocaine and atropin solutions there is nothing so effective as heat. A high temperature, however will blunt the edge of cutting instruments, so they are immersed in Squibb's alcohol for twenty minutes, and then dipped into sterilized water (which has been sterilized by boiling) just before making the incision. We have shown elsewhere that absolute alcohol while not near so valuable as heat is a useful germicide for all ordinary purposes, and can be used here, for the importance of a sharp instrument, especially in cataract operations, can not be overrated. For irrigating the conjunctival sac water which has been boiled can be used. It would seem then that in the present state of our knowledge the eye presents a more favorable field for applying the principles of asepsis

than of antiseptis.

Jackson, of Philadelphia, said we should not bandage the eye 24 hours before the operation, and place it to that extent in worse condition than before. Lachrymal obstruction is very frequently found, and in those cases a careful examination of the nose will show more cause. While the antiseptic treatment of the instruments and the proper preparation of the conjunctival sac and the exterior of the eye are important, it seems that the most important is the thorough aseptic management of the wound. In cataract extraction, removal of the lens substance and in some cases washing out of the anterior chamber. The antiseptic treatment of the wound itself includes the snipping away of fibers surrounding the foreign body, the careful cleaning out of the tissues in punctured wounds of the eyeball and the removal of blood clots and of the foreign body itself.

Buller, of Montreal, said both his colleagues and himself are firm believers in antiseptics, and he was induced to bring this subject before the Ophthalmic section of the association on account of adverse opinions held by different ophthalmologists. A year ago a prominent member of the American Ophthalmological Society said that antiseptics were not necessary in eye surgery, especially for cataract extraction, and his success, and that of surgeons before the antiseptic era set in was just as good now as when so much pains were taken. His own practice did not differ materially from that described by Noyes, though much of his work was done outside of the hospital, in boarding houses and hotels where thorough asepsis could not be carried out. He did not bandage the eye for 24 hours before the operation with the idea of inducing a certain amount of secretion to ascertain its character. He begins the preparation of the patient by using soap and water two hours before the operation, washes out the eye with boric solution, powders in dry boric acid, occludes by absorbent cotton, and is especially careful about cleansing the edges of the eye-lids. He believes that pure boric acid powder is more efficacious than the weak solutions generally used. Before the operation the eye is again washed with boric solution. He prefers moist dressings for 48 hours after cataract operations, etc., and after that dry dressings dusted with boric acid or mixed with iodoform. He changes these dressings once a day. Patients with eczema of the eye-lids and face should be carefully prepared.

Fryer, of Kansas City, said Wells of the Johns Hopkins Hospital found in his experience in general work that he rendered surfaces

aseptic by cleaning and separate applications of sublimat solution, and if he made a scraping from the parts and put this in a culture medium he got no results. He differed with Randolph and stated that if the proper efforts are continued long enough with weak solutions of bichlorid it will not only render the eye aseptic but pass down into the lachrymal sac and render that aseptic. He has frequently kept suspicious eyes ten days to three weeks under 1:6000 solution of bichlorid of mercury, and though at that time some yellowish discharge remained he had done the operation without any evil results. Sublimat should be used, as boric acid is no better than so much hot water or normal salt solution, and is not germicidal.

Rivers, of Denver, said it has been his habit in all operations in which the eye-ball is opened, if time allowed, to use two days preliminary antiseptic treatment with 1:3000 sublimat solution together with hot water and soap. It was not his idea to kill or remove all germs from the sac, but he believed that a germ rendered sick or crippled by antiseptics could not stir up as much trouble as a well one.

Mittendorf, of New York, arose to make a plea for the much abused boric acid. He made experiments several years ago with atropin and other solutions made with boric acid solution or with boiled water, keeping them in large mouthed bottles for several years, and found that at the end of this period that the preparations which did not contain boric acid were full of germs, whereas the preparations containing boric acid, and especially the boric acid solution itself had kept for years thoroughly aseptic. 3 % boric acid solution has likewise an advantage over simple boiled water, because it comes closer to the specific gravity of the natural secretions of the eye. As a dressing for the eye after operations it has the advantage over the other moist dressing by preventing the sticking together of the eye-lids. He has used the method described by Noyes, and thinks it is the best.

Ryerson, of Toronto, has seen the underside of the lid scrubbed with strong solutions of boric acid or bichlorid before operation, but his experience has been that more harm is done than good. Washing out of the anterior chamber should not be carried out in every case as a matter of routine. In two cases he has had resulting suppuration of the cornea in persons suffering from nasal catarrh. The nasal cavity bears a close relation to the conjunctiva, and should be attended to.

Würdemann, of Milwaukee:—Has prepared patients for the more formidable operations in much the same manner as that described by Noyes with the exception that the occlusive bandage applied 24 hours

before operation is not practiced. He considers that the responsibility of cataract extraction is so great that except in exceptional instances, patients should only be operated upon under the most approved aseptic conditions. His own practice and that of his colleague was under such control that they refused to operate in private or boarding houses or hotels except when rooms could be properly prepared and skilled attendance could be afterwards secured. If the necessity for such be known most patients would submit to the slight inconvenience or extra expense thereby involved. Most major operations were made in specially prepared rooms in the hospitals. Any solutions or appliances used about the eye for the graver operations should be prepared by a responsible nurse or by the physician himself and not made by the apothecary, interne or ordinary nurse. Only skilled attendants should be allowed to handle the dressings. Especially solutions of cocain, holocäin, atropin or eserin, which might be needed for instillation into the eye, should be rendered aseptic for each operation; in fact for each instillation sterilization is necessary not only of the solutions but of the droppers as well. Such solutions are usually made by himself or immediate associate in order that the responsibility of their sterilization might be insured. The cleansing of instruments is not left to the nurse but done personally. The new local anesthetic holocäin in addition to its many other advantages over cocain, its quick anesthetic qualities, its rapid absorption and its property of keeping the cornea moist and not affecting the epithelium is also of great value in that solutions of the drug are not only sterile but antiseptic, antiseptic qualities of a $\frac{1}{2}\%$ or 1% solution being perhaps equal in value to that of 1:10000 corrosive sublimat. He has used the new drug very many times for different purposes among them being a score of the principal eye operations notably four cataract extractions, iridectomies, squint operations, etc. A stock bottle of a 1% solution made for a month has remained sterile during this time and it is claimed that solutions will not only remain aseptic but are likewise indefinitely antiseptic.

The President then enquired concerning this new anesthetic and was replied to by Würdemann.

Kipp, of Newark, had performed under the most unfavorable conditions, on the upper floor of a tenement in the wall of which were a number of water closets, a series of 15 cataract extractions within a short period. The only precaution was to clean the eye with boiled water, clean instruments and sterilize dressings. There cannot be very much danger from atmospheric infection.

Calhoun, of Atlanta, said in his section of the country there is a large proportion of negroes and he is compelled to operate not only in hospitals but in boarding houses and huts and with the antisepsis such as he carries out he finds very little difference in the results. The negro conjunctiva is different from the white, it will not tolerate a very strong solution of cocain or sublimat. He uses $\frac{1}{2}\%$ of cocain for operation, dropped in frequently which answers in the white as well as in the negro, although it requires a few moments longer for anesthesia. While the instruments are being prepared a drop is put in the conjunctiva every minute and in the course of 5 minutes the eye is ready. It produces less irritation than the 4% or 2%. The stronger solutions of cocain have irritating effects upon the negro, not in the white. Solutions of bichlorid are not tolerated. He cannot use it at all upon the negro and has seen decided irritation from 1:5000 solution. He has noticed, if there is much cortical substance remaining, there is more liability to irritation. He does simple extraction. He does not think the strong solution of boric acid has any advantage over hot water. Suppuration in a negro is an unusual thing and he has not seen it in a wound in years. He makes a very large number of cataract operations. The gentlemen who know the habits of the negro, how uncleanly he is, and the difficulty in making him clean shows that nature takes care of his wounds.

Williams, of Boston, corroborated Würdemann in regard to the good effects of holocäin as an anesthetic. It has worked extremely well and can be used in a weaker solution than cocain. As to its germicidal effects he could not say. In making watery solutions of atropin, eserine, cocain etc., it is quite advisable to make them with a solution of boric acid as it keeps them better and has no bad effects in any way.

Alt, of St. Louis. Asepsis more than antisepsis seems to be the rule. He corroborated Noyes and uses moist sublimat solution dressings after the operation. Sublimat solution 1:10000 for washing the eye out as well as bandage or dressing. He does not use bandages but adhesive plaster for the operation and a moist pad of cotton which can be moistened from time to time with a solution of sublimat. He does not look at the eye after 24 hours but allows it to remain closed until 4 or 6 days have passed, as it is wiser to leave the wound quiet as long as there is no bad indication. He has lost faith in what little antiseptic qualities boric acid is supposed to have, partly on account of the fact that some solutions which have been standing in his office

showed large growths of germs. He boils the water right where he operates and pours it over the instruments. Absolute alcohol, boiled water, then wiped dry and used.

Baker, of Cleveland said it has been his practice to follow as nearly as possible the method of Noyes with the exception noted by Jackson. He does not use the moist dressing or the occlusive bandage. Immediately before the operation, sometimes a week or two before, he applies it in cases where there is some doubt. It seems that if there is any practical good to be gotten from this discussion it is that in regard to asepsis versus antiseptics. Is it a question of simple cleanliness, or is it a question of applying something to kill germs? He thinks that it is cleanliness, following this out carefully in every particular and in the careful preparation of all the drugs and instruments that are used in connection with the case. He believes that the boiling water is the best and uses it in all cases except for the cutting instruments. For these he uses alcohol and wipes them dry afterwards.

Foucher of Montreal said boiled water was used in his practice in preference to the antiseptics.

Proudfoot, of Montreal has the patient and the eye thoroughly washed with a solution of bichlorid not stronger than 1:10000. If the solution is used stronger there may be a good deal of conjunctival irritation. He uses a good deal of absorbent cotton. He dips the instruments in boiling water before using and immediately afterwards. If the knives after using are dipped in boiling water and thoroughly wiped the chances of any microbes remaining, which may do damage, will be much diminished. He applies plaster in cataract dressings placing perchlorid cotton over that and in cases where there is any loss of tissue ties strips of adhesive plaster. In hot weather the patients will stand this more comfortably than a bandage, complaining of the extreme heat of the latter.

Howe, of Buffalo:—The question arises as to what is the best antiseptic. We must come to some agreement and should defer to the bacteriologist rather than to simply the result of our own clinical experience. One is a strong advocate of that plan and an other of this. We are no judges of the question but should leave the settlement of the relative value of the various antiseptics to the bacteriologists.

Spalding, of Portland, said in one or two cases where there has been inflammation in the tear sac, and treatment with probes and syringing with various aseptics has been of no use, he has had good results by closing the puncta with the galvano-cautery. It may be

of use where there is suppuration of the sac. Eczema of the eye-lids should be treated with boric acid. If an eye has been operated upon unsuccessfully with proper asepsis and has been lost then it should be removed before any operation is done on the second eye. His experience in those cases is in three instances. In the first case every precaution was taken but the eye was lost by suppuration. In the other cases he removed the stump of the operated eye before extraction and in those cases the operation went perfectly well. He had not heard any discussion on this point and it is a question for the removal of the stump, whether painful or not, previous to operating on the second eye.

The President described the method used by himself and English colleagues as follows:—The preparation of the patient, instruments, dressings and place for operation is practically the same as described by Noyes. He uses cleanliness and bichlorid solution for the operators hands, especial importance is attached to cleansing of the eye-lashes and eye-lids. Disease of the lachrymal sac or duct is attended to. Some of his colleagues syringe the lachrymal passages or close the duct in suspicious cases. Instruments, except knives, are boiled and then placed in carbolic solution. Most English operators use plain boiled water or carbolic solution. They do not always take the time to sterilize dressings by steam heat before using. Some use moist dressings and some dry. Just before operation most English surgeons use 1:5000 sublimat and some use boric acid solution to wash out the conjunctival cul de sac. He uses in his own private practice boiled or distilled water for after dressings. Cleanliness is of more importance than the use of solutions which may kill germs.

Noyes of New York does not subject the cutting instruments to boiling but dips them into boiling water and then into alcohol which answers the same purpose. There is no occasion for dulling the edges by hot water. In the beginning of his professional career it was almost an invariable practice to remove the lost eye and that was done upon the ground of possible sympathetic inflammation and that practice continued for very many years. Within the last 10 or 15 years he has preferred to let it remain as the danger is slight and he is not inclined to disfigure the patient.

F. Buller, M. D., of Montreal, read a paper upon **“Mules Operation”**

Since the year 1885 Buller has performed the operation of evisceration of the eyeball with insertion of an artificial vitreous or glass

globe a great many times according to the method described by Mules in the *Transactions of the Ophthalmological Society of Great Britain*, Vol. V, p. 200. His earlier operations were not altogether satisfactory. The reaction was severe and in about one case in three the glass globe was extruded after a few weeks or months. These failures he believed were due to the impossibility of keeping the wound aseptic during the healing process. On this account he was led to modify the operation as follows: 1, dissection of the conjunctiva for some distance around the cornea; 2, removal of the cornea with a triangular portion of the sclerotic above and below; 3, the scleral aperture after insertion of the globe (which must fit into the sclera without tension) is brought into perfect co-aptation by means of four or five white, china silk sutures size 0.0, passed through the whole thickness of the sclera, about 1 m. m. from the edge and allowed to remain (buried sutures); 4, three or four black silk sutures (Irondyed, size 1) are made to unite the conjunctiva *transversely* i. e. in a horizontal direction. Those, of course, come away. Thorough asepsis before, during, and after the operation is essential to success. A few hours before the operation the face and eyelids are thoroughly cleansed with soap and warm water and then with solution of perchloride of mercury, 1 in 2000. The conjunctiva with 3% warm solution of boric acid. The closed lids are then bandaged, beneath a dressing of absorbent cotton freely dusted with boric acid powder. The same cleansing process is repeated shortly before the operation. The scleral contents are entirely removed with a Volkman's spoon and the cavity assiduously flushed with perchloride solution 1 in 3000. It is not necessary to wait until all bleeding has ceased before inserting the globe, but the globe, after its insertion, and cavity are irrigated before the sclera is united. When all the stitches have been inserted the conjunctiva is irrigated with boric acid solution and dusted freely with fine iodoform powder, an absorbent cotton compress dusted with the same and a compression bandage is the final act. This dressing is not removed before 48 hours. If there is then much reaction, swelling and pain, ice cold compresses soaked in weak perchloride solution, are then laid over the lids and frequently changed, for two or three days, if not, the eye is cleansed with boric acid solution and dressed as before, once daily.

In from five to seven days the patient is practically well.

The records of the last ten cases treated in this way show that nine were perfectly successful. One failed as might easily have been predicted at the time of operation. It was a small shrunken eye and no glass globe could be obtained nearly small enough and a large gold

head was used instead, even with this the scleral edges could hardly be united. It came out at the end of four weeks. He has not performed this operation in any case of acute suppuration of the eye-ball, or in any case where sympathetic ophthalmia was present or seemed imminent, nor in any case of sarcoma of the choroid and he does not think it advisable where the eye-ball is very much shrunken.

In all other cases he believes it to be very much preferable to enucleation simple evisceration or optico-ciliary neurectomy. Besides the cosmetic advantage gained by a better stump for wearing an artificial eye the Mules' operation gives a healthy conjunctiva, not in a state of chronic irritation from retained secretions so often seen after enucleation, and therefore not so liable to ulceration and cicatricial changes.

Reeve of Toronto has tried substitutes for the Mules' operation. He has always stitched the scleral wound so as to insure strength and prevent the introduction of germs. He has always been in favor of introducing antiseptics within the globe and prefers 1:1000 formalin. He finds an advantage in using the sharp edged steel curette which takes out the choroid well. He presented a forceps with two rows of sharp teeth at the point. The scleral lip is grasped with this and the needle inserted between the two lips. The sclera is separated and the needle put in. In one case he found Mules' operation of special benefit. One of the house surgeons last year lost his eye by treating gonorrhoeal ophthalmia. In this case there was secondary staphyloma. Mules' operation was done. He has been practicing for some time and no one knows that he is wearing an artificial eye. He described a modification of Mules' operation, in which, instead of inserting a glass ball or other foreign body, the walls of the exenterated globe were allowed to fill with a blood clot and then stitched together.

Noyes of New York said that in New York the Mules' operation has not gained much following. He has never done it, being deterred from it on account of the statement that from 4 to 6 weeks are necessary for recovery and the reaction very severe. Belt of Washington reported some time ago the introduction of a piece of sponge in the cavity of the sclera. Lautenbach had 7 or 9 cases and he was led to follow his example and that method of procedure. It was a most disagreeable operation. It took 3 weeks to 6 months for the stump to heal. Perhaps you may put a sponge in the sclera and cover it up tightly and secure the same result that you get with the glass globe. The insertion of a piece of sponge may answer the purpose where we may not secure a properly shaped glass globe.

The President has done it but once. More of his colleagues are beginning to do it. Noyes' remark that the reaction is so great has deterred many others from using it. That is not always the case. There is usually a certain amount of reaction for about 7, or 8, or 9 days. Some think it is objectionable. When a large globe is to be inserted it is better to take away the cornea.

Ayres, of Cincinnati, said that in a case of his the globe was opened and properly prepared and the glass ball inserted. In a day or two irritation followed and he had to remove the stitches and take out the glass ball. When the ball was removed he found a hole in it and some pus had forced its way into the glass bulb. This only shows that a defective bulb may be inserted and cause infection as it did in that case.

Buller, of Montreal, said he was aware that the operation spoken of by Reeve, allowing the cavity that has been filled with blood instead of inserting an artificial bulb, gives apparent satisfaction in some cases. He never did the operation as a substitute to the Mules' operation, and has always thought that we should give that operation an impartial trial before thinking of resorting to any substitute. This applies also to the insertion of a sponge instead of the glass globe. The glass globe does answer the purpose very satisfactorily and stays in place. He has had cases under observation for 12 years. By careful operation the glass globe will be retained for an indefinite period in almost every instance.

Reeve, of Toronto, said that his remarks did not refer to a substitute for Mules' operation. It was done before Mules. Evisceration followed by allowing the globe to be filled with blood makes a better stump than enucleation.

Geo. M. Gould, M. A., M. D., of Philadelphia, read a paper upon "**Retinitis Pigmentosa without Typical Pigmentation.**" Has found 5 cases reported which are undoubtedly similar to his, but 4 cases contain no charts of visual fields for colors and two are without fields for white as well as other important details.

1st case. A young lady, aged 26, a type-writer. Complained of headache and other symptoms due to eye strain, was refracted under mydriasis; ophthalmoscopic examination negative. On leaving office one day she noticed a doubtfulness of stepping in the darker hallway and a groping motion with hands and feet. Inquiry brought out the fact of difficulty of walking at night for three years. He speaks of a significant sign of the limitation of visual fields, the bowing of the head

in going over rough or dark places, bringing the images nearer the center of visual field. Visual fields were taken showing about $\frac{1}{2}$ normal white field while those for red, blue, green and yellow, are very irregular in outline and in relation order. Careful ophthalmoscopic examination of the periphery of retina showed numberless obscure tiny brownish or blackish dots, some of these assuming a band like arrangement. There were no pigment heapings and the stippling gradually ceased toward the centre. Patient was not color blind but showed hesitency as to certain colors until they approached the center of the field. In examination of a brother, sister and mother, nothing was detected except in a sister an almost indistinguishable stippling near the periphery was noticed; perimeter showed normal field. In one brother a condition very similar was found, excepting visual field are not so markedly abnormal. He gives quite full reports of the 5 cases found similar to his and comments on the unreliable definitions given the words hemeralopia and nyctalopia, and concludes with the advice to watch carefully for any hint or sign as the "bowed head sign" and inquire if patient sees as well as other people at night. If not, carefully examine field and under mydriasis the periphery of fundus with ophthalmoscope.

Howe, of Buffalo, said he had collected histories of 41 cases. He did not find the form without pigment degeneration to be so uncommon. We have the typical form of the disease and also a form where the subjective symptoms are present and the objective absent. We have also cases where we find the subjective symptoms are absolute, and where we get good fields. Very interesting cases appear in which one eye alone is affected. It is now accepted that these forms of retinitis pigmentosa begin in the choroid and that it is but a form of choroiditis.

Gould, of Philadelphia, said that the cases reported showed absolutely normal fundus except slight changes in the extreme periphery. There were 7 cases of absolutely normal fundi except the night blindness. It is quite likely that such cases are slipping from our hands. The bowed head was a characteristic symptom.

(To be continued.)

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ORIGINAL ARTICLES.

A REPORT ON HOLOCAÏN AS A LOCAL ANESTHETIC. IN OPHTHALMIC WORK.

By
H. V. Würdemann, M. D.,
and
Nelson M. Black, M. D.,
of Milwaukee.

A number of articles have been published during the last six months in the German periodicals concerning a new local anesthetic, which is a derivative of P-phenetidin, named by its makers Amidin and Holocaïn and chemically known as P-Diathoxyathenyldiphenylamin. It is a product of the Meister, Lucius & Brüning Works, Höchst a. M.

A sample was obtained and experimented with and has been somewhat extensively used in our practice for the last two months.

It is a white crystalline substance, a strong base, feebly soluble in cold water to 2½%, soluble in alcohol, ether and hot water; fuses at 121° C., neutral reaction, not changed by heating, although when heated in glass gives off a free alkali affecting glass making a turbid solution so should be heated in porcelain; sterilizing by heat is unnecessary as a 1% solution is directly bactericidal. Solutions are stable, a 1% solution remaining clear for two months.

We tried it first upon ourselves; anesthesia was produced in fifteen seconds with two or three drops of a 1% solution, lasting ten minutes and upwards; the application was attended by a slight smarting that lasted for about thirty seconds, but no more than from cocain, followed by a sensation of coldness and slight moisture which lasted

for several hours. The lids were squeezed slightly at first due probably to irritation of the sympathetic; an increased hyperemia of the vessels of the conjunctiva was noticed in all cases which lasted from one half to one hour. The cornea was moist and did not desiccate. The tension was not noticed to have been diminished as suggested by some experimenters. No action on pupil or accommodation was noticed in any case. Anesthesia lasted 12 to 15 minutes.

1st case.—Cataract operation with iridectomy on an old German woman; three instillations of a 1 per cent. solution, one minute apart, were used. She did not feel either the contact of the instruments or the cutting of cornea or iris.

2nd case:—Cataract operation on an American woman; had had a preliminary iridectomy done followed by choroiditis and iritis, with posterior synechia; three instillations of a 1 per cent. solution were used before operation. A portion of the iris was removed and complete toilet of anterior chamber made; one more instillation being made during operation. Patient said she felt no pain could only feel something was being done.

3rd case:—Cataract operation with iridectomy, an old English woman; same amount of holocain used and complete anesthesia produced.

4th case:—A double iridectomy on an old Irish woman, very nervous and ignorant, said she did not feel any pain.

5th case:—A total tenotomy on an eighteen year old boy of extremely neurotic type, total anesthesia was produced with five instillations; three before and two during the operation of a 5 per cent. solution. This solution on standing deposited a large quantity of crystalline holocain, the solution was used in this condition of saturation on case No. 6.

6th case:—A double tenotomy and advancement on a Polish girl; two instillations were used before operation and on complaint during suturing an additional drop was instilled.

7th-9th:—The 1 per cent. solution was used in three canaliculotomies with complaint of pain in only one case.

10th-11th:—Two chalazia were removed with about same complaint from patient as with the use of cocain.

12th-15th:—Several foreign bodies removed from conjunctiva.

16th-26th:—Ten foreign bodies in cornea, some quite deeply impacted, one or two drops of the 1 per cent. solution sufficing to produce complete anesthesia.

27th:—A melanotic sarcoma of conjunctival limbus, size of a hazel nut was removed, the origin being scraped and conjunctiva sutured, without the patient feeling any pain whatever.

28th:—Curettement of large ulcer of cornea with absolutely no pain after three instillations of the 1 per cent. solution.

29th:—One drop of the above solution used before application of galvanic electrode to corneal opacity, (has been used for a dozen applications.)

30th:—Many applications of blue stone, silver, alum have been made and are greatly facilitated, as there is no blurring of vision after the use of holocain.

*The advantages of the anesthetic are:—its nontoxic action in local use, the stability and bactericidal quality of its solutions, the rapidity and completeness with which it produces anesthesia, the length of time the anesthesia lasts, the nondilation of the pupil, making it especially useful before applying irritating medicines as no unpleasant blurring of vision is noticed afterward, and the ready absorption of the drug enabling deeper operations to be performed. The drug is used in one fifth the strength of cocain and is proportionately already cheaper.

The only toxic effects that have been observed were in its use hypodermically, it producing clonic spasms like those of strychnia, when injected under the skin of animals.

Literature of Holocain to September 15, 1897.

1. Darby, H. (*Bost. Med. and Surg. Jour.*, June 3, 1897.)
2. Gutmann, (*Deut Med. Woch.*, No. 11, March 11, 1897.)
3. Heinz, R. (*Centrabl. f. prakt Augenhkde.*, Feb., 1897.)
4. Heinz, R. and Schlosser, C. (*Klin Monbl. f. Augenhkde.*, April, 1897.)
5. Hirschberg, (*Klin, Mon. f. Augenhkde.*, May, 1897.)
6. Kuthe, R. (*Centrabl. f. prakt Augenhkde.*, Feb., 1897.)
7. Loewenstamm, (*Therap. Monats.*, May, 1897.)
8. Tauber, E. (*Central, f. prakt. Augenhkde.*, Feb., 1897.)
9. Würdemann, (*Annals of Ophth.*, July, 1897.)

*Since writing above nearly a month ago a number of other operations have been made under this anesthetic with the same results.

A CASE OF ACUTE INSANITY DUE TO EYE STRAIN.

By Murray McFarlane, M. D.

Rhinologist, etc., St. Michael's Hospital,
Toronto

Mrs. A., aged 27 years, referred to me by Dr. Waddy, of Rosseau, Muskoka, with the following history.

For several years she had suffered severe pain in the eyes, especially the left accompanied by occipital and frontal headache. Family history excellent, no insanity, health has always been good, never had a common "cold" until last week when she had a slight cough for the first time. Her husband informed me that the headaches had been gradually increasing in severity for several years, and culminated a few weeks previous to his consulting me, in acute insanity or delirium necessitating restraint.

Dr. Waddy, his family physician reviewing the case came to the conclusion that the eyes were the cause of all the trouble and advised that an oculist should be consulted. This was reluctantly agreed to by her family who could not believe

that eye strain was the factor in causing the troublesome symptoms. When brought to my office, Mrs. A. was suffering intensely, was very melancholy and would scarcely answer any questions put to her. No disease was to be found until the eyes upon ophthalmoscopic examination, the fundus being normal, hyperopia was found in the right eye and mixed astigmatism in the left, while muscular tests showed a slight hyperphoria. Without a mydriatic the refraction was as follows: O. D. +0.50 D. sph., O. S. +1. D. sp. \ominus 3 D. cyl axis 15°. With atropine (gr. 2 to oz. i) instilled into eyes 3 times a day for a couple of days the result was: O. D. +0.75 D. sp. O. S. +1.75 D. sp. \ominus 2.25 D. cyl axis 15°.

The latter correction was ordered, with entire relief of all the symptoms, showing that the nerve storms from the uncorrected anisometropia with spasm of accommodation so clearly shown by the result attained by the use of a mydriatic were the causes of the the mental trouble, which has entirely passed away, according to her physicians report.

The case is of interest, as it suggests the query as to what might have been the result if the error of refraction had been left uncorrected might not chronic melancholy or other brain trouble been the result?

A CASE OF SYMPATHETIC OPHTHALMIA FOLLOWING A SUCCESSFUL CATARACT EXTRACTION.

By W. L. BULLARD, M D.,

Columbus, Ga.

The most of us are ever ready to let our successes go on record and serve as an illuminator to our monument, but when those smiles of fortune are mingled with non-success we are loathe to turn over such plain cold facts to the sculptor, yet occasionally, though, not often, some of us are tempted to "enter where angels fear to tread" and paint both sides, that our "Fraternally" may criticise—not the doctor as is often the case—but the question, and govern themselves accordingly.

On the 16th of last November, I operated on Mrs. R. age 52, for senile cataract. I did Graefe's modified extraction with iridectomy. Parenthetically I'd say that I am fully aware of the fact that the large number of the leading oculists of this country and abroad favor the simple operation, yet I cannot divine why any one should do the simple operation in preference, when the only thing that can be said in its defense is 'that it leaves an ideal pupil'—a thing that the blind patient takes so little interest in; and should you question him with the interrogation. What kind of pupil—the ideal or coloboma? the answer will be something like this. "I beg for the restoration of sight irrespective of pupil or its shape." If this be so, then why add to his risk—the simple is more risky—and defer his hope?—it prolongs the treatment. My patient being an ideal one the operation was done without the least trouble or accident, and progressed as favorably as any case I ever operated on. I have done something over three hundred operations.) Three

weeks from the day I operated patient visited my office and I refracted the eye and with plus glass 12 D. distant vision was 20/30 and with plus 18 D. patient could easily read ordinary print. Two weeks later, patient had not worn the glasses. I was sent for and found what I thought to be a case of slight iritis. Patient two days before this attended morning mass, the church being about one mile distant from her home, and on this particular morning it was very cold, and besides patient had also sat on the front porch at night and watched the exhibition of fire works about this time so I readily concluded the trouble was from exposure to cold etc. In a few days it occurred to me that my atropia (I am cognizant of the fact that *some* of the wise men affirm that atropia is contraindicated in this disease and when we couple this with the lamentable fact that the etiology and pathology of this deplorable disease is more questionable than the propositions of Euclid induces me to say that as yet there is no golden key with which to unlock this mysterious door) drops were not doing any good and I had a case of iridocyclitis. At this time patient complained of having la grippe and I advised removal of the ball which was objected to. In a few days the unoperated eye became inflamed and she became wild, perfectly crazy and continued so for six weeks. To make a long story short patient continued crazy for six weeks when her frantic delirium began to leave her and she began to improve mentally and physically, but the sympathetic trouble ran its course and at present, eight months since the operation the eyes have spells of inflammation which lasts a few days and then pass off leaving the eyes comfortable for two weeks or more.

This is the only case I have ever had of this kind and in as much as there was no anterior adhesion nor cystoid of the iris, I cannot understand why I should have had this one, unless it was, as I firmly believe, due to the indiscretion of the patient subjecting herself to extreme exposure. Dr. Knapp of New York City whose experience is second to none tells us—see Ophthalmic Record Vol. vi, page 385—in his last 891 extractions, two lost sight in the eye operated upon and two lost sight in the opposite eye from sympathetic ophthalmia. Drs. Kitchens and Walker of this city were kind enough to see the case with me.

A RARE REFRACTION CASE.*

By J. STEELE BARNES, M. D.,

Milwaukee, Wis.

Refraction cases that are both difficult and interesting are frequently brought to the notice of all ophthalmologists; but the one I have to report is particularly interesting as well as extraordinarily rare.

Mr. A, aged 33, referred to me by Dr. Gilles for correction of myopia, stated that his vision had always been exceedingly poor, especially that of the left eye, glasses giving very little improvement. The last lenses ordered gave him vision of $\frac{6}{24}$ in the right eye and $\frac{6}{60}$ in the left. Without any correction visual acuity

*Read at the Fifty-First Annual meeting of the Wisconsin State Medical Society, May 1905.

was, right=counting fingers at three meters, left=counting fingers at two meters. Ophthalmometer gave astigmatism of 2.75 D against the rule in the right and 7.50 D against the rule in the left. Ophthalmoscopic examination was unsatisfactory, but I was able to get an approximate refraction. Retinoscopy was exceedingly difficult, the corneal and retinal reflexes appearing to move in different directions, thus confusing the shadow; but taking my cue from the readings of the ophthalmometer, I was able after considerable time, care and patience to obtain the following refraction. Right eye, perpendicular meridian-6.50, horizontal-3; left eye, perpendicular meridian-11, horizontal-4, and this proved to be very nearly correct. I was then enabled without much waste of time with the test lenses to order,

$$R -4.50 \text{ sph. } \ominus -3 \text{ cyl ax } 90^\circ = \frac{6}{12}$$

$$L. -5 \text{ sph. } \ominus -8 \text{ cyl. ax. } 90^\circ = \frac{6}{12}$$

thus bringing the vision in both eyes up to $\frac{6}{12}$.

These revealed a new world to him, and I think I never before saw a patient evince such joy and delight. He had previously been informed by oculists that his left eye was amblyopic congenitally, and that he would never be able to use it. The particular feature of interest in the case is the 8. D. cyl. against the rule. Never before have I personally known, nor can I find any case reported where such a high correcting cyl. was fitted, except after cataract extraction or traumatism. In this case, the lens was present and no accident had ever happened to the eye. The astigmatism was entirely corneal. The case also demonstrates the value of Javal's ophthalmometer, and if the oculists, who had previously had Mr. A, under observation had possessed that instrument, I have no doubt they would have been as successful as I.

CORRESPONDENCE.

PITTSBURGH, PA., AUGUST 24th., 1897.

TO THE EDITOR OF THE OPHTHALMIC RECORD:

Will you kindly allow me a few lines of your space to thank Dr. Kirkendall for calling my attention, in the August issue of your Journal, to Dr. Ziegler's paper dealing with the topic which formed the subject of my article in the July issue of the RECORD? I was not present at the session of our state society at which that paper was read and, in some unaccountable manner, had quite overlooked it. It was, therefore, in ignorance of the fact that I was travelling the pathway already marked out by my gifted friend and classmate, Dr. Ziegler, that my paper was written and without any intention of raising a claim of priority.

Dr. Ziegler will, I know, should he have remarked it, accept this apology for my failure to acknowledge his precedent work along the lines with which my paper dealt, in view of my lamentable ignorance. Dr. Kirkendall will please accept my thanks for his courteous note.

I am, very truly yours, FRANK H. EDSALL.

REVIEWS.

Further contributions to the bacteriology of keratitis—particularly of the purulent form of the disease. Uhthoff and Axenfeld. The present short communication* is a description of the results obtained by the authors during their investigation of sixty eight cases that are new and is intended to supplement their article published two years ago in the same journal regarding fifty cases. It was then said regarding *ulcus corneae serpens*: "According to our opinion mixed infection occurs and there by a less striking clinical picture results. The degree of virulence and the capacity that the living tissue has for resistance may be modified by the nature of the originally causing lesion, as happens in the case of other organs, without thereby disturbing the typical picture. This qualifying behaviour of the cause of the pus formation in the cornea, under certain circumstances offers another means for differentiating between inflammatory processes." "The typical *ulcus corneae serpens* were 34 in number and in all but one were the pneumococci of Fraenkel-Weichselbaum unmistakably found and in the greater majority existed as a pure culture. The microorganisms found in a few cases with the pneumococci were *xerosis bacilli* and *staphylococci* but in such small proportion that the aetiological importance of the pneumococci even here was undoubted. In twelve cases of this group a purulent tear passage offered a complication; five of these were carefully examined and the pneumococci were found alone in two but associated with other microorganisms in the remainder. Insomuch as in its earliest stages this condition presents itself only as a non-typical corneal infiltration if pneumococci are found as a pure growth in such, one might expect a typical *ulcer serpens* to develop in the course of a few days. The *diplo-bacillus* found by Morax in *blepharo-conjunctivitis* was present in great numbers in the single case in which the pneumococcus was absent. The next group consisted of 13 cases of atypical *hypopyon keratitis* and in general may be defined as differing from the former in extending not so much along the superficial layers of the cornea as in depth with an ulceration presenting a crater-like appearance with an ultimate tendency to perforation. Bacteriologically this class of cases resolve themselves as follows; only pneumococci found twice; pneumococci and other microorganisms, i.e., *pyogenes*, *staphylococci* and

*Weitere Beiträge zur Bacteriologie der Keratitis des Menschen, insbesondere der eitrigen. Von Uhthoff, and Axenfeld. Graefe's Arch. XLIV, 1.

streptococci; three times; bacilli and cocci not pneumococci, eight times. The complications in this group of thirteen cases were trachoma in four; blepharo-conjunctivitis in two; acute catarrh in one; blenorrhoea of the sack in one. In this latter group the conjunctival condition is the more important complication, the lachrymal inflammation appearing only once and in an instance where the pneumococcus was the only microorganism found. The next group consisted of three cases of kerato-malacia following xerophthalmia, all being in children less than one month old and characterized bacteriologically by the streptococcus and the pseudo-diphtheritic bacillus. Three of the five cases of superficial scrofulous keratitis examined, were found to be of the fascicular variety while the other two appear as a corneal infiltration, the microorganisms being the xerosis bacillus and the staphylococcus. Seven cases of dendritic keratitis were examined and in two only were the xerosis bacillus found alone although in two others it was associated with staphylococci while the findings in the remaining cases of this group were negative. Notwithstanding that the xerosis bacillus was found with relatively great frequency, it is too soon to consider it to be the prime cause of the corneal process but rather as a contamination of an old corneal condition; at all events it has not been possible to identify a particular microorganism as giving rise to this especial condition. The bacteriological finding in one case of rodent ulcer was negative. In two cases of corneal pannus the xerosis microbe was found once while in the other there was nothing found. The finding was negative in one case of hereditary interstitial keratitis of specific origin as was also the results of the examinations of two corneal complications following "spring catarrh." As a result of this recent series of investigations it is found that in almost all cases which can be clinically diagnosticated as typical *ulcus corneae serpens* the diplococcus of Fraenkel-Weichselbaum (pneumococcus) is present and in a great majority of cases as a pure culture and is in a relatively small number of cases associated with other microorganisms, as for example the staphylococcus and the xerosis bacillus. This finding is still more significant, as, in the first series, were isolated cases in which pneumococci were not found. Attention has been called to this and an unsuitable media was considered as the cause for it. The new experiments have confirmed earlier experiences and therefore the pneumococcus must be considered as the cause for the pus in *ulcus corneae serpens*. Only once has it not been found and then the diplo-bacillus of Morax was present. The then expressed conjecture that

occasionally pneumococcus infection of the cornea, according to the character and depth of the lesion, the degree of virulence etc., could proceed under other clinical pictures finds confirmation in this new series of cases. For example, in one of the cases in which the cornea had suffered from a deeply penetrating wound giving opportunity for infection of all the layers although only pneumococci were found the ulcer had at first somewhat less of a seriginous character. As yet no satisfactory explanation has been given regarding the immunity of young children to this variety of ulcer. Frequently only pneumococci were found within the limits of typical ulcers complicated with tear passage troubles, while the sack contained other organisms as well, which would suggest some antagonistic property possessed by the pneumococcus tending to inhibit the growth of other germs in a territory already occupied by them. This was noticed even in ulcers of some considerable standing. Many times subcutaneous injections were made in white mice with the pneumococci obtained from pure cultures of the *ulcus serpens* which usually resulted in a pneumococcus septicaemia with a fatal termination and finding in the blood of the characteristic diplococci with a capsule. This new series also includes one case of kerato-mycosis aspergillina which with the one already studied gives a percentage of nearly two, which seems rather high although this condition probably occurs more frequently than one would suppose from the few cases reported by others. Associated with this were a few staphylococci and xerosis bacilli but they had apparently nothing to do with causing the corneal process.

The authors then discuss the various articles upon purulent keratitis in man which have appeared in the interval between their own publications. Kalt ascribes the ulcerations in blenorrhoea, which do not at all resemble *ulcus corneae serpens*, to staphylococci. In his opinion the quick recovery in some of the cases is due to the destruction of the microorganisms by phagocytes before they pass the membrane of Bowman. Hori has found streptococci in the infiltrated margins of atypical ulcers. Morax has cultivated the diplo-bacillus of chronic conjunctivitis from an atypical infiltration. The appearances noticed by Zirm beneath the epithelial defect in keratomalacia has not yet been sufficiently inquired into. Nüel attributes a peculiarly appearing superficial localized keratitis following an injury by ammonia to considerable masses of cocci but it does not seem reasonable to consider this to be analagous to the so-called superficial keratitis punctata and to be dependent upon a migration of microorganisms. Coppez

mentions the injurious effect of the toxins in diphtheritic conjunctivitis. De Schweinitz believes staphylococci to be one of the causes of supuration after cataract extraction and refers to the suggestion of Haab regarding the pyocyaneus as a cause of traumatic panophthalmitis which Randolph claims is sometimes due to the coli communis. It is not surprising that the pneumococcus is to be found with other organisms in wound infection and in panophthalmitis when the nature of the lesion would be rather unfavorable for the development of the ulcer serpens. Bach no longer considers that the different varieties of keratitis arise chiefly from staphylococci and admits that his former objection to the aetiological significance of the pneumococci rested chiefly upon experiments made upon animals. His negative inferences seem to have been due to faulty methods as positive results are almost certain to follow a proper utilization of material obtained from a typical ulcer serpens when in an active state. Any one of three things can militate against a successful outcome; either an improper method in taking away the material from the ulcer, or in the transferring it to the culture media, or the nature of the media itself, this latter being the most frequent cause for failure. Therefore when the pneumococci are found in cover glass preparations from an ulcer serpens, even though they may not grow in the oven a negative opinion should not be immediately given. The authors have almost never noted a failure when they made use of blood serum tubes and feel certain that their few failures during their first series of examinations must rather be ascribed to a faulty technique and now believe the blood serum is superior to agar. The principal result of the Bach-Newman work is that they now recognize the pneumococcus as the important aetiological factor in *ulcus corneae serpens* and they even go so far as to call it the *pneumococcus ulcer*. The article concludes with a list of important contributions to this subject which have been published during the last two years.

WM. DUDLEY HALL.



REPORTS OF SOCIETIES.

NOTES OF THE PROCEEDINGS OF THE OPHTHALMOLOGICAL SECTION OF THE XIITH INTERNATIONAL MEDICAL CONGRESS.

Moscow, August 19th—27th, 1897.

By **CASEY A. WOOD,**
of Chicago.

Although there was nothing startlingly new presented at this meeting the sessions were, in some respects, unique performances. As one of the many evidences of the desire upon the part of our hosts to please and entertain us, the papers announced to be read in Russian were withdrawn. These were subsequently translated and presented in French or German or they remained to be subsequently dealt with by the committee on publication. Moreover, the discussion was rarely carried on in Russian although there were quite a number of native ophthalmologists present who were not sufficiently conversant with French or German to allow them to take part in the proceedings. Altogether there was an average, daily attendance of 150 members, with, perhaps, twice that number accredited to the section. Germany and German speaking localities were best represented, among others, by Hirschberg, Kuhnt, (Königsberg,) Fuchs, Uhthoff, Schmidt-Rimpler, Fukala (Vienna), Mitwalsky (Prague), Pflueger (Berne), Deyl (Prague), Nieden (Bochum), Mandelstamm (Riga), Schanz (Dresden) and Elschnig (Vienna). Russia came next with such men as Bellarminow (St. Petersburg), Krukow (Moscow), Wagner (Odessa), Ewetzky (Moscow), Hirschmann (Charkow), Dolganow (St. Petersburg), Golovine (Moscow), Blessig (St. Petersburg) and many others. There were fewer representatives of France and French-speaking cities than I expected, but among them were the bearers of the following well known names: Chibret (Clermont-Ferrand), Dor (Lyons), Dufour (Lausanne), Darier (Paris), Vaucher (Orleans), Vignes (Paris), and Lavagna (Monaco). The names of deWecker, Galezowski, Parinaud, Nuel, Javal, Meyer and several others were down for papers but they did not appear. Italy sent a few of her best men, among them the kindly and venerable Reymond of Turin. Prof. Angelucci (Palermo), Dr. Cirincione (Naples), Dr. Roselli (Rome) and Dr. Gondenzi (Turin) were also present at the Congress. Schiötz (Christiania) and Normal-Hansen (Copenhagen) represented Scandinavia. The

only British paper on the whole list was one by Hinschelwood of Glasgow. This fact and the almost complete absence of attendance from Great Britain were explained by the meeting of the British Medical Association in Montreal at the same date as the Moscow Congress.

There were very few American ophthalmologists present and only two of these (Dr. Southard of San Francisco and the writer) had the hardihood to read papers in English. Indeed, these communications, with Hinschelwood's paper, made the number three—Knapp's paper being offered in French.

The sessions of the Section were held in the amphitheatre of the Moscow Ophthalmic Hospital, a well equipped member of a numerous collection of hospitals, laboratories, dispensaries etc., known as the *Dievitchie Pole*, mostly directed by professors in the Faculty of Medicine of the Imperial University of Moscow. This hospital has 34 beds—four for acute contagious cases—and is in every respect equipped as a first-class teaching institution, with a good laboratory, library and museum. In 1896 there were 292 indoor patients, and 355 major operations were performed. The dispensary received 3209 outdoor patients. *Considering that the hospital—indoor and outdoor—is closed for three months of the year this is a pretty fair showing.*

There was but one criticism that might be advanced of the choice made for holding the ophthalmological and other sections in the *Dievitchie Pole* and that is its great distance (three quarters of an hour's drive) from the headquarters of the Congress, in the centre of the city. On the other hand, Prof. Krukow and his *confreres* furnished a luncheon to members so that there was no need of returning to town at the noon recess.

Before discussing the meeting of the section in detail, notice should be taken of the Moscow Ophthalmological Society (*Cercle Ophthalmologique de Moscou*), a flourishing institution founded in 1887 by Ewetzky and others. Many of its papers and all the proceedings since 1892 have been published in the "*Westnik d'ophthalmologie*". On its tenth anniversary the Circle issued, in French and German, reprints of these and other communications and presented them to members of the Ophthalmological section of the Congress. Several papers, owing to their publication in Russian journals, are new to us and will repay perusal. I have no doubt but that copies of the book, especially if for libraries, can be obtained by addressing Prof. A. A. Krukow, Moscow.

Of the 83 reports and papers on the program the first one was presented by Uthhoff on the *Bacteriology of Keratitis and Conjunctivitis*.

Although we are not yet in a position to separate the various forms of corneal disease by means of a bacteriological examination alone, the latter should never be neglected, as a valuable aid to diagnosis and assistance in the treatment of cases. In many instances all that is required is a cover-glass preparation, stained after the method of Gram. Probably we are only in a position to speak positively about the bacteriological relations of *ulcus corneae serpens* and of *keratomycosis aspergillina*. The other microorganisms that give rise to purulent processes in the cornea do not produce definite signs or symptoms. Scrofulous (phlyctenular, eczematous) keratitis is not produced by pyogenic bacteria, a fact that should be noted in dealing with it, both clinically and from the standpoint of treatment. Spreading corneal ulcer is in all probability always produced by the Fränkel-Weichselbaum diplococcus. Whenever it occurs we have the clinical picture of *ulcus serpens*, and it is doubtful whether it ever produces a condition much differing, clinically, from the well known characteristics of eating ulcer of the cornea. Conversely, it is doubtful whether this formidable disease is ever produced in the absence of the diplococcus. It must be remembered, however, that injuries of the cornea followed by deep infection from the pneumococcus may produce an hypopyon-ulcer that tends to spread, and that a mixed infection with pneumococci may set up an atypical purulent keratitis. When atypical cases of hypopyon keratitis occur we usually find that they are due to the presence of other pyogenic organisms, such as staphylococci or streptococci. It has so far not been possible to produce in the lower animals a typical, spreading ulcer by inoculation with pure cultures of the pneumococcus. So long as no perforation of the cornea and Descemet's membrane has occurred bacteriological examinations of the hypopyon have been negative. If the early infiltrated area of an infected cornea be examined and pneumococci be detected, the disease should be at once treated as a spreading ulcer even if there be no other indication of the disease. The microorganisms of corneal disease are generally derived from the neighboring parts, conjunctiva, lachrymal sac, lid edges, nasal cavity etc. It is rare that infection is introduced by the instrument inflicting a wound. For *keratomycosis aspergillina* the *aspergillus fumigatus* is probably responsible. Other forms of keratitis are not accompanied by any particular organism. Those that have been isolated are the Fränkel-Weichselbaum diplococcus, streptococci, staphylococci, Pfeiffer's bacillus, *bacillus pyogenes foetidus*, *bacterium coli*, *bacillus pyocaneus*, *diplobacillus*, *ozenabacillus*, *aspergillus fumi-*

gatus, tubercular bacillus and the lepra bacillus. Even in conjunctivitis *gonorrhoeica* and *diphtheritica* the corneal complications are not, as a rule, the result of direct gonococcus and diphtheria-bacillus infections but of secondary purulent infiltrations. The so called xerosis bacillus cannot be put down as the cause of any definite corneal disease, although it is found in several forms of keratitis. In infantile xerophthalmus with keratomalacia the ordinary pyogenic bacilli (streptococci and staphylococci) must be credited with the damage done. Phagocytes cannot be said to play the chief part in the destruction of the organisms of keratitis.

As with keratitis it is impossible to assign to each form of conjunctivitis a certain bacteriological origin. Not only do some forms of conjunctivitis present no particular microorganism but the same agent may set up various and varying symptoms. The cover-glass examination is still the most important and the Gram method the most valuable. The bacteria that without doubt set up conjunctivitis in man are Neisser's gonococcus, the Fränkel-Weichselbaum diplococcus, the Koch-Weeks bacillus, the streptococcus pyogenes, the Klebs-Löffler diphtheria bacillus and the diplobacillus of Morax and Axenfeld. The other organisms found in the sac, Uhthoff does not consider of much importance in the etiology of conjunctival disease. The gonococci (not stained by the Gram process), when few in number and not very active, may set up a simple catarrhal conjunctivitis only, or may produce a granular condition of the lids quite similar to that found histologically in trachoma. The ophthalmia of the new born is only occasionally produced by the coccus of Neisser. The Fränkel coccus sets up a mild though contagious form of conjunctivitis that tends to early recovery. It is also found in chronic forms of the disease. Children are especially affected and false membrane is not uncommonly formed. This pneumococcus conjunctivitis is very likely to be associated with catarrh of the respiratory tract. There can be doubt of the contagious character of the process occasioned by the Koch-Weeks bacillus, not stained by Gram. It sets up a typical, acute conjunctivitis, accompanied by marked swelling of the tissues and the formation of a superficial pseudomembrane. Corneal complications are rare. Streptococci, stained by Gram, may set up a severe conjunctivitis and, according to Parinaud and Morax, affect the deep tissues of the eye, producing iritis etc. Moreover, they may give rise to the formation of false membrane and even produce death of the superficial layers of the conjunctiva, swelling of the preauricular glands, and

corneal complications. The diphtheritic conjunctivitis following scarlatina is due to these cocci. There is some doubt about its contagiousness. The Loeffler bacillus, stained by Gram, may, like the foregoing, lead to the formation of false membrane but the underlying tissues are more involved. Rarely, the diphtheria bacillus sets up only a simple catarrh of the conjunctiva. The conjunctiva of the sound eye may be infected by its fellow—a fact not to be forgotten in considering the question of immunity. A mixed infection of diphtheria bacilli with streptococci and staphylococci does not necessarily render the succeeding conjunctivitis more virulent. Uhthoff strongly recommends the Ernst-Neisser method (acetic-acid,—methylen-blue, followed by a watery solution of Bismark brown) of staining in the differential diagnosis between virulent diphtheria (Löffler) of the conjunctiva and other forms of membranous conjunctivitis. He does not think that the ordinary cover-glass preparations are to be depended upon. Several weeks elapse before the bacilli disappear from the sac. The serum treatment is recommended when the bacteriological examination indicates it.

The diplococcus (not stained by Gram), lately described by Morax and Axenfeld, is probably a not uncommon cause of conjunctivitis, but its course is usually chronic from the beginning, with few symptoms of irritation, a slight amount of secretion, and very little swelling. Solutions of zinc sulphate act very promptly in arresting the progress of the conjunctivitis which, though very contagious, rarely spreads to the cornea. No micro-organism peculiar to trachoma has yet been isolated, nor has the bacillus of mild follicular catarrh of the conjunctiva been discovered, although it is possible that the pseudogonococci of Michel and others belong to a certain class of these cases. Any form of conjunctivitis may be modified by a mixed infection.

The question of refraction was barely touched upon—only four or five papers being read on subjects connected with it. When one notices the badly centered lenses—mostly *pincenez*—worn by almost all classes on the continent, has witnessed the measurement-methods generally employed in the clinics, and has looked in vain for systematic examinations of the extrinsic ocular muscles, he must conclude either that all the difficult cases emigrate to America or that ametropia does not worry the population of Europe as it does with us.

I was greatly disappointed that Nuel of Liege did not read his paper, "*Toxic Amblyopia is not primarily an interstitial optic neuritis but is a disease of the macula lutea.*" I hope to be able to present this essay in English form for the benefit of our readers.

Hirschberg gave a very spirited report on the *Prevention of Trachoma—the people's disease*. He showed that although there are, as is well known, localities in which trachoma is rare—a clinic in Switzerland having but 6 cases in 30,000 patients—the disease is universally distributed over the face of the earth. Wherever there are human beings, there is, or sooner or later will be, trachoma. He did not advance any new suggestions as to its treatment, which must be carried out with particular regard to the needs of each locality. Half a day was given to the discussion of this subject. Kuhnt drew attention to the nasal complications of the disease and advised that the nose and neighboring cavities should always be examined and treated, if need be. He has been in the habit of performing the operation first proposed, I believe, by Heistrath. About one-half the tarsus, with a corresponding strip of conjunctiva, as well as (in some instances) a portion of the retrotarsal are excised in cases of recurring pannus and, indeed, in many instances where the cornea is only slightly affected but where the disease has finally implicated the submucous tissues. There was a general disposition to cast cold water on the proposition that true trachoma can be cured in six weeks by squeezing with forceps or by the use of any other instrument, that while surgical expedients are undoubtedly valuable in their proper place they should always be followed by topical applications, of which Roselli advised iodine compounds and Nenadowic itrol, as substitutes for blue stone. Darier thinks that no violent surgical treatment should be attempted until the usual mild means have been carefully tried. There were various forms of trachoma forceps exhibited by members, one, in a case with a small spoon and lance, to be used for precisely the same purpose that Gifford advises—the removal of irritant foci buried beneath a thin covering of cicatricial tissue in old cases. Dr. Katharina Kastalsky, one of the young lady ophthalmologists of the section, read a very clever account of the *hyaline bodies first found in trachomatous lids by Vennemann*. These examinations were made of excised conjunctiva (mostly the folds) in 59 cases. The hyaline bodies were found in every instance, being plainly stained both by the method of Gram and that of Ziehl-Neelsen. They are of various sizes and lie mostly free, between the cells. It rarely happens that one meets with hyaline “drops”—cells containing the hyaline bodies—where the cellular protoplasm is undergoing the secondary change, after which it rapidly frees itself from the surrounding wall. In none of the examined cases was there any indication of hyaline degeneration

of the vascular walls or of the connective tissue bundles. There was no reaction to the amyloid test in any case. These bodies are not peculiar to trachoma but their presence argues in favor of a chronic process resembling it.

Nieden read paper on *Ankylostomiasis and its effect upon the organ of vision*. So far as I know the ocular relations of Minér's anaemia have never been discussed before any American Medical Society and I am sure that the readers of the RECORD will be glad to know that Nieden's paper has been exclusively contributed to this Journal and will appear as an English translation in the November number.

The third report was by Fukala on "*The present status of the operations for the relief of myopia.*" The general opinion seemed to be that removal of the lens in high degrees of myopia is a most valuable expedient, but the operation should not be performed except under the most favorable conditions—absence of intraocular disease combined with the inability of the patient to make effective use of the eyes, with or without glasses. Fukala still prefers the discission method, even in persons over 16 years of age, although Vignes and others do simple extraction. Pflüger was in favor of the operation but had seen cases of subsequent vitreous opacity as a late sequel, even where the immediate results of the operation were all that could be desired. He advises the operator to leave the posterior capsule intact. Schmidt-Rimpler did not think the amount of the myopia was to be considered so much as the ocular condition of the patient. Can he earn a living? is the principal question. He thought it was doubtful whether the removal of the lens influences the subsequent increase of the myopia. Fukala objects to the use of the small Graefe knife, owing to the escape of vitreous, but advises that the discission needle be used thoroughly. This is passed in and a wide crosscut made through the anterior capsule into the substance of the lens. Afterwards atropine and the ice bag should be used for the relief of pain and other symptoms, but extraction at the limbus should not follow unless glaucomatous signs persist. This will rarely be needed and even then, if the keratome be employed, its point may be used to break up the lens mass. Removal of the lens does not predispose to detachment of the retina; it is well known that this accident often happens where there has been no surgical interference. Fukala enlarged upon the well known discrepancy between the refraction of some myopic eyes before and after operation. Von

Hippel had a case that measured—20D. before and + 4 D. after operation. Another had —22 D. before removal of the lens; + 5 D. afterwards. He explains this by contraction of the overstretched globar tissues as well as by the “pull” of the extrinsic muscles upon the eyeball. Fukala has noticed deposits on Descemet’s membrane and believes these to be lenticular cells. Vacher thinks that extraction acts as a prophylactic against retinal detachment.

There were shown several rather ingenious *attachments to spectacles for the temporary relief of ptosis*. These were made of padded piano-wire, and engaged the upper lid along its middle raphe, keeping the eye well open, and without causing pain.

Lavagna of Monaco read a paper extolling the merits of *arecoline hydrobromate as a miotic, and especially as a substitute for other miotics in glaucoma*. He showed charts illustrating numerous experiments made with the drug.

Wagner of Odessa is an *iridectomy-in-glaucoma* enthusiast. Of 75,000 carefully registered cases he had seen 1,000 instances of glaucoma and believes that more women than men suffer from the disease. When performed early enough, iridectomy is a curative procedure in the very great majority of instances, and there is no operation that will compare with it. Several speakers, among them Pflüger, did not agree with the orator and made a very decided exception in cases of chronic glaucoma, where the results were far from satisfactory.

Dr. Normal-Hansen presented a paper on *contusions of the eye ball with special regard to the fundus changes* following them. Examination of a large number of cases showed, in some, acute oedema of the retina, either from direct blows on the globe or from *contre coup*. The swelling, best seen along the vessels, disappears without disturbance of vision and leaves no fundus alteration whatever. In a second series of cases, generally where the traumatism is greater, the oedema disappears less quickly, leaving permanent evidence of the lesion, usually most marked about the fovea (traumatic changes in the macular region). These latter are, (1) macular alterations with typical rupture of the choroid, (2) macular changes with other affections of the choroid, (3) macular lesions alone. In all probability all the fundus lesions are of the nature of rupture of the choroid and possibly of the external layers of the retina. The secondary lesions show themselves in accumulations of pigment, in cicatricial plaques and in sub-choroidal and sub-retinal hemorrhages. These lesions affect that part of the fundus which is the favorite seat of choroidal ruptures generally, viz; the macular region and the space between macula and papilla.

Deyl of Prague presented a case of unilateral (left) *coloboma of the macula lutea with post mortem report*, drawings and microphotographs. A number of members, including the writer, were of the opinion that the connective-tissue thickening, blood-vessel distribution and pigmentary deposits argued rather for intra-uterine macular disease than for true coloboma. If it be coloboma it is the first case of the kind examined microscopically. It occupied the temporal region two d.d's from the disc and was five times the size of the latter. There were a large pigment blotch in the centre and several smaller deposits on the border of the alleged coloboma. All traces of true choroid were wanting, its place being taken by a layer of connective tissue, that sent processes into the surrounding vitreous. The retina over the spot was defective at its borders where the external layers were wanting. The space between coloboma and papilla lacked normal choroid, whose place was taken by a connective tissue layer in which there were few vessels. The retina here had lost its external layers, although the inner ones were quite normal.

The final and one of the most important reports was that by Raymond of Turin, on the *Therapeutic value of subconjunctival injections*. There was not much enthusiasm displayed in favor of this method, while some members, like Adamuk, affirmed that after a faithful trial they had failed to obtain any particular, beneficial results from its use. It was suggested that paracentesis corneae relieves the pain and increases the curative effects of the remedy. Kuhnt considered it of special value in infective keratitis with discolored iris and beginning hypopyon. After enumerating the various substances—mercuric (1:5000-10000), and sodic (1:30-100) chlorides, hydric chloride (1:5000), quinine, toxins, salicylic acid, sodic sulphate, pyogenic bacteria, etc., used for the purpose the reporter said that solutions of sublimate more powerful than 1:2000 are always painful and sometimes dangerous, but that (except the occasional adherence of conjunctiva to sclera) 1:4000 is unobjectionable and readily borne by most patients. He believed, however, that 1:5000 or even 1:10000 without sodic chloride, is all that is required for ordinary cases. Injections of 1:2000 he gives only in special cases, as in injecting beneath Tenon's capsule in sympathetic disease. There can be no doubt of the penetration of the mercuric salt into the deep tissues of the eye (as witness the experiments of Bocci, Botardi and others) although there is some doubt how this is accomplished—possibly as an albuminate. The chief agents employed as substitutes for sublimate are mercuric cyanide and salicy-

late, iodine trichloride (Pflüger) and sodic salicylate (van Moll). He referred to Mellinger's experiments, where solutions of common salt (1--13%) gave practically the same therapeutic results as the sublimate solutions. Dor and de Wecker had obtained good results in detachment of the retina from sub-Tenonian injections of sodic chloride (1:20-30). Reymond thinks that although the procedure is a valuable one it should be used with caution and that we do not as yet know its *modus operandi*. In pyogenic infection of the cornea he believes solutions of sublimate, cyanide and salicylate of mercury to be more valuable than other remedies, and advises the injection to be made beneath the capsule of Tenon in sympathetic inflammation. These are the two conditions in which he has himself found the remedy of particular advantage, although he has obtained good results in other isolated instances.

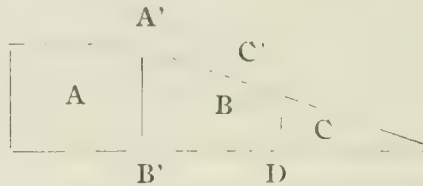
Darier read a very interesting paper on the same subject. Although not a panacea he had found subconjunctival injections of marked value. Solutions of sodic chloride have a very decided stimulant and trophic action, while the chloride and cyanide of mercury exhibit resolvent and antiseptic powers. In serious infective lesions following injuries or operations sublimate injections are the best and most certain remedies we have, and they should be given a trial. In sympathetic ophthalmia they are a very valuable remedy, especially in conjunction with mercurial inunction. In infective ulcer of the cornea subconjunctival injections, when employed with the galvano-cautery, bring about a rapid cure with a minimum amount of corneal opacity. Darier thinks that they *may* assist a cure in other forms of keratitis as well as in iritis, iridochoroiditis, neuritis, retinitis and retinal detachment. He especially recommends them in macular choroiditis, having often observed their prompt effects. Even in affections *a priori* incurable, as congenital choroiditis, myopic alterations, retinal hemorrhages etc., he has witnessed decided improvement. Apart from these results, which Darier regards as definitely proven, he suggests experiments with *injections of extract of the ciliary body*, which he has himself tried with encouraging results in threatened atrophy of the globe and in the early stages of cataract. He quoted the report of Dor, who cured a case of sympathetic ophthalmia by the subconjunctival injection and instillation of extract of the bovine ciliary body. He also spoke of the work of Coppez, who proved the great value of antitoxin serum injections in the ocular diphtheria of rabbits, produced artificially. He has himself been engaged in trying the effect of Marmoreck's antitoxic serum in rheumatic iritis.

Among the instruments exhibited to the section were Schiötz' *prismatic apparatus for the determination of the relative strength and condition of the eye muscles*. This instrument is not new and is described in the *Archiv für Augenheilkunde* Bd. XX. pp. 1-46.

Hinschelwood exhibited and gave a demonstration of the use of *Reid's portable ophthalmometer*. I was much impressed with the practical value of this instrument when I first became acquainted with it (see *Annals of Ophthalmology*, 1896, p. 322 and 1897, p. 454) and can warmly recommend it even to those who already possess a recent Javal-Schiötz model.

Prof. S. Baudry of Lille, demonstrated an easy *method of producing monocular diplopia* by the aid of a simple prism and showed its application in the detection of simulated blindness. This is a modification of the well known Graefe test but is considered by Baudry to be superior to it inasmuch as it is not likely to be understood by even the most intelligent simulators. The bi-refractive prism of Galezowski, Monoyer's double prism and the apparatus of Frölich allow equally the production of monocular diplopia or triplopia, but Baudry thinks that there are inherent sources of error in all these tests. For example, there is a decided difference in the clearness and coloration of the real and false images. The latter, as shown by refractive prisms particularly, is by no means as brilliant as the former. He also believes that the shape of the prisms may be taken into account by an intelligent pretender who will soon recognize the varying action of the refractive medium. He considers that in his little instrument these objections are removed and that the person under observation cannot distinguish the false from the true image and cannot tell whether the diplopia is monocular or binocular. Moreover the simulator does not know whether the prism affects one eye or both. Baudry places before the light—a candle frame at three metres—a piece of well made, dark red glass, because he has found that with a red light there is a marked difference between the true and the false image and it makes it impossible to say whether the double images are due to a monocular or binocular diplopia. The instrument itself consists of a prism, C (see figure) with its base applied to the glass figures A and B. These are made of plane window glass, carefully cut and with polished joints, covered by a round metallic box pierced, on each face, by a central opening, one 6 mm. and the other 3 mm. in diameter. A very simple device allows sometimes one sometimes the other line of separation (A' B' or C' D) to be placed in front of the sound eye and before the other eye

the second opening, which may, of course, be either the base of the prism or the prism itself. As the exterior of the instrument gives no



indication of its internal arrangement and the character of the images furnishes no clue it is impossible for the suspect to guess correctly what test is being applied even if he knew the construction of the apparatus. All the various tests for the detection of simulated monocular blindness may be applied with this prism.

The section had a dinner, in the Hermitage restaurant, that would have done credit to Kinsley or Delmonico—a dinner that presented gastronomic features not to be encountered outside of Russia.

REPORT OF THE PROCEEDINGS OF THE SECTION OF
OPHTHALMOLOGY OF THE BRITISH MEDICAL ASSO-
CIATION; 65TH ANNUAL MEETING; MONTREAL
CANADA, AUGUST 31 TO SEPTEMBER 4, 1897.
REPORTED FOR THE OPHTHALMIC RECORD

By H. V. WÜRDEMAN, M. D.
Of Milwaukee

(Continued from September number.)

Dr. George H. Matthewson reported **A Case of Metastatic Adenocarcinoma of the Choroid**. Metastatic carcinoma of the choroid is of sufficiently rare occurrence to justify me in recording a case of the kind which through the kindness of Dr. Buller I have recently had the opportunity to study in detail. The patient, a lady of forty-eight, came complaining of almost complete blindness of the right eye, which had come on rather suddenly three months previously. The eye appeared quite normal externally, but the ophthalmoscope showed a large detachment of the retina occupying the lower part of the fundus. The refraction did not vary much from normal so when the age of the patient was taken into consideration this spontaneous retinal detachment suggested an intraocular tumour. To make a diagnosis possible Dr. Buller punctured the sclera and drew off a considerable quantity of serous fluid and the following day found the retina in its

normal position and at a short distance below the optic nerve a small flattened ovoid swelling was seen. Now for several years the patient had had a large firm nodular tumour in the thyroid. The character of this thyroid growth with the condition of the right eye, afforded a probable diagnosis, "Malignant growth in the thyroid with metastasis in the choroid." It was decided to remove both thyroid and eye at the same time and accordingly Dr. F. J. Shepherd extirpated the glandular tumour while Dr. Buller enucleated the eye. On cutting the eye open, a small flat ovoid tumour, with roughened surface was found immediately below the optic nerve. The microscope showed that the growth was chiefly in the choroid, the sclera and optic nerve being invaded to a slight extent by tumour cells while the retina was apparently free from invasion. The minute structure of the tumour was that of an adeno-carcinoma. Dr. Wyatt Johnston examined the thyroid tumour and found it was also an adeno-carcinoma. In nearly all the cases on record (about twenty) the primary tumour was in the mamma and in none was it in the thyroid which gives the present case some special interest.

For full accounts of the literature on the subject see papers by Mitrialsky, Schultze, Holden and Vainseke in the *Archiv Ophth.*, N. Y. and that of Noyes in *Trans. Amer. Ophth. Soc.* VIII 538, 18.

A paper was then read by the Secretary upon "**An Unusual Case of Orbital Tumor**" by Lee, of Liverpool, which was supposed to be malignant. Diagnosis of Carcinoma having been made by expert microscopists but which after having been partly extirpated returned. The second growth, one year later, being found to have disappeared of its own accord.

Holt, of New York, said this case reminded him of one that he had 12 years ago. A young man in Boston, who had a growth in the orbit. The doctor told him he was going to die. He had some swelling of the lachrymal glands and as the upper lid was everted the tumor extended down on the lid of the eye. Local application made of glycerid of tannin and under that the growth disappeared, parts healed and became normal. He has been well ever since.

The President said there is a considerable number of cases in which mistaken diagnosis is made by the microscope. He quoted the case of a patient with orbital tumor which was first incompletely operated upon with resultant disappearance of the tumor.

Specimens of microscopical sections of opaque nerve fibers were shown under a microscope, having been prepared by Usher of Aber-

deen. Treacher Collins, and Devereux Marshall of London, had sent a number of pathologic specimens in jelly. Priestly Smith, of Birmingham, had sent pathologic specimens in formal and a model illustrating Tscherning's theory of the accommodation.

A. Alt, M.D., of St. Louis, read a paper on "**Histology of an Unusual Case of Total Blindness after Injury to the Skull.**" Eye-ball had been removed by another surgeon on account of a bullet entering from the temple and ploughing upwards through the cerebrum. The patient was seen half-an-hour later by an oculist, in the meantime two physicians had been probing the the wound and removed some brain substance together with chips of bone and blood clots. The patient was semi-comatose. There had been hardly any hemorrhage, the left eye-lids were swollen. Antiseptic dressings were applied but exophthalmus occurred shortly afterwards. Three days after the injury, the cornea not being covered by the eye-lids, decay set in, whereupon the eye-ball was enucleated. The bullet was probably lost in the frontal sinus. The enucleated eye-ball was sent to Alt, who divided the same, which showed extensive hemorrhages in all the tissues of the eye-ball. Manifold ruptures and changes in the retina and choroid on microscopic examination. There were evidences of beginning formation of new blood vessels and retinal degeneration which is remarkable as only three days passed since the injury. The optic nerve was not severed by the bullet which passed along the superior wall of the orbit, causing hemorrhage back of the eye and immediate blindness and exophthalmus. The hemorrhage was believed to be due to the contre coup as there was no damage done to the outer surface of the eye-ball. He exhibited 2 micro-photographs which showed the hemorrhagic conditions.

The President remarked upon a like case of a man who received many shots in the face without the eye-ball being penetrated although some reached the orbit. There were many ocular hemorrhages the sight being damaged.

R. A. Reeve, M.D., of Toronto, read a paper on "**Experiences with Cataract.**" Being a personal relation concerning his cataract operations.

George T. Stevens, M. D., of New York, read a paper upon "**Suggestions Regarding an Element in the Aetiology of Trachoma**" with three principal types of crania recognized by anthropologists. The author has found characteristic directions of the orbit in relation to the plane of the horizon.

The cranium being in a position corresponding to the "primary

position" in the living subject, the axis of the orbit in the *meso-cephalic* cranium is directed above the plane of the horizon. In the long skull, the *dolicho-cephalic*, the axis is directed to a marked degree downwards. In the broad skull, the *brachy-cephalic*, the orbital axis also points downwards but to a degree less than in the case of the long skull.

The normal plane of the visual lines, when the minimum of nervous energy is directed to the eye muscles, corresponds with the direction of the axis of the orbit. In meso-cephalic heads there is generally anophoria, that is, a tending of both visual lines to rise above the plane of the horizon. In the dolicho- and brachy-cephalic heads the direction of the visual plane is down. There is katophoria.

In anophoria the eyebrows press down upon the lids and the lids press heavily on the eye-balls. In katophoria the eye-lids are loosely applied to the surface of the eyes causing little pressure.

The author regards the pressure of the lids in anophoria as an important element in the aetiology of trachoma. He has never seen the disease in cases of katophoria, its appearance being always in connection with anophoria.

The negroes of the United States, most of whom have the long, the dolicho-cephalic heads and the Bavarians among whom the brachy-cephalic type of head predominates and other nationalities where either the long or the broad skull prevails are comparatively immune from trachoma. On the other hand the Italians, the Irish and the Japanese, among whom the extreme meso-cephalic type prevails are unusually susceptible to the affection. The practical side of this view of the importance of anophoria as an element in trachoma is that if by carefully executed relaxations of the two superior recti the anophoria is corrected, and the visual plane is made to correspond to the plane of the horizon, obstinate cases which resist the ordinary forms of treatment recover without other therapeutic means.

The author recapitulates as follows:

- 1st.—During two years of careful examination I have found no case of trachoma in which the condition of anophoria did not exist.
- 2nd.—Nationalities in which the form of the head indicates a prevalence of anophoria are especially subject to trachoma.
- 3rd.—Nationalities in which the dolicho- or brachy-cephalic head is the predominant type and in which therefore the direction of the visual plane is that of katophoria, are comparatively immune from trachoma.
- 4th.—Relief to the condition of anophoria by bringing the normal

visual plane to a more favorable position is habitually followed by the most gratifying improvement in the trachomatous conditions.

The President said that the subject seemed to be one in which contributions from the various members regarding the racial relations of trachoma would be in order and asked Stevens what type of head was the prevailing one among the Jews and among the Egyptians.

Stevens answered that as far as his observations went they were of the meso-cephalic type. The face and lower jaw being long and the head high in proportion to its width and length. It differs decidedly from the typical Bavarian head which is broad, low and wide and the chin quite prominent. The Egyptian head belongs to the meso-cephalic type and is thus predisposed to trachoma.

Foucher, of Montreal, said he has made many researches of trachoma in Canada especially among Indians and has found only 3 cases of trachoma during 30 years. In Quebec he found several in the extreme north. In Ottawa he never found a case of trachoma among the Indians. Never found a case among the Indians around Montreal where he practiced very much. In many parts of Manitoba the Indians are subject to trachoma. He said that he found many missionaries who went to Alaska say that the Indians have attacks of special disease which exists in winter, fall and spring. He heard that this disease is not really trachoma but an affection from the snow.

Gould, of Philadelphia, said he has been so accustomed in practice to consider eye strain and ametropia as the cause of conjunctivitis that Stevens' communication strikes him with wonder and delight. He does not see why the pressure of the lids and eye-brows should induce trachoma. Eye strain is a great and constant cause of the incipient stages of conjunctivitis which leads into trachoma. Wherever eye strain exists the only cure is to stop the incipient cause.

Proudfoot, of Montreal, in speaking of trachoma among the native Indians, Foucher has not seen trachoma among them at all. In 20 years in Montreal he has seen half a dozen cases of trachoma among the Indians who live 8 or 10 miles above the city. With that exception he has in 8 or 10 years never seen trachoma among the Indians. In late years not at all. The Indians must have contracted the disease from nationalities living in the city.

Howe of Buffalo said while this theory is very beautiful still we must keep in view the actual facts which we have in trachoma. As to the methods of examination for the visual lines being above or

below the visual planes, an examination with the tropometer of quite a number of normal cases who have never complained would show much the same variation. Swan Burnett sent him a negro eye-lid; a series of sections were carefully studied and showed utterly no variation from the white. In 1877 he was in Egypt and found that the principal factor in the spreading of trachoma there was the carrying of contagion by the flies. The evidence is that when the fly touches the eye-lid of the individual of the patient he takes the disease and inoculates the next patient. As to the question of the race. After studying that and going to Wurzburg he was very much astonished and dismayed that the greatest amount of blindness was in Lapland where the flies were comparatively rare. With the Laps the cause was quite apparent. The people live in houses which have no chimneys and the place becomes filled with an atmosphere of smoke.

Osborne, of Hamilton, said he had taken occasion to ask the government physician in a large reservation where there were several thousand Indians, who vary a good deal in their way of living, but this man in all the years he had been government physician had never seen a case of trachoma.

Ryerson, of Toronto. Eye disease among the Indians is rare. He had examined a considerable number of Indians and found that granular disease is unknown though extensive pterygium is prevalent. He has never seen pterygium which had reached so high a degree as among the Indians.

Fryer, of Kansas City, confirmed the last two speaker's statements having had an opportunity of examining a large number of Indians at different times for ordinary conditions and never saw one case among them of trachoma. He noticed, however, pterygium in many. He has seen it in Cheyennes, Sioux, Comanches, Apaches and numbers of the Nez Perces.

Stevens, of New York, recognized the importance of eye strain in trachoma due to ametropia or heterophoria. The measurements of skulls which he has made have been done in the museums. He has not examined Indian skulls.

F. Buller, M. D., of Montreal read a paper upon "**Abnormalities in the Function of Extrinsic Ocular Muscles.**"—He gave a report of 110 cases operated upon for heterophoria stating that only this number had been found suitable for operation in 10,000 eye patients. He does not operate upon lateral deviation of less than 2 or 3 degrees or hyperphoria of less than 1 degree. He considers the normal standard, ad-

duction to be 5 to 8 degrees; the normal adduction 25 to 50 degrees; sursumduction 2 to 3 degrees. This may be increased in any direction by exercise. Prisms give great relief in neurasthenic persons. Operation is to be practiced in but few. There were 37 cases of esophoria, 31 of exophoria, 30 of hyperphoria. In only 12 was there combined horizontal and vertical deviation. In only 2 of these upward and inward deviation, which seems to contradict the theory of Stevens that most cases of inward deviation are caused by hyperphoria. Of these there were 88 cured, 37 benefited, 8 unimproved and the result in 6 cases unknown, making 87 per cent benefitted, harm being done to the patient in no case. He considers the operation on the ocular muscles to be harmless in selected cases. Many of his cases had little or no refractive error. The refraction is always corrected if necessary and prismatic glasses seldom prescribed. He does not consider that general organic diseases can be caused by the muscular or accommodative asthenopia although he recommends in all cases of general disease the neutralization of any considerable degree of refraction or muscular anomaly.

Stevens, of New York, said in regard to the marked discrepancy which appears in the literature of heterophoria in which almost every man appears to have been a law unto himself in his methods of examination it would seem that the methods of examination and the system of terminology which has been used could be improved upon. But so long as we continue this classification and its terminology, so long as we discuss heterophoria we should confine ourselves to the exact meaning of the terms we use and employ uniform methods in order to arrive at our conclusions so that we can make comparisons. He has, in Norris & Oliver's System of Diseases of the Eye, brought together all that was necessary to understand the meaning of these terms and the method of getting at the conditions. Buller has given us the example to take abduction of 5 degrees. In the Norris & Oliver's System he has given abduction as 8 degrees. We cannot both be right in that way and if we make our reports from this different standpoint we don't arrive at sufficient uniformity. If we use a phorometer we should get certain records. If we use the Maddox rod we get others. We should get almost anything with that form of instrument. The two methods do not give uniform results.

Mittendorf, of New York, asked Buller whether he had occasion to repeat the operation or the tenotomies. As greatly as he admired the genius of the man who has systemized the abnormalities of the

muscles yet he did not think he has found the ideal way of treatment for, if we see patients that have been operated upon 20 or 30 times and find them unrelieved, it seems there is something wrong and he referred to cases that have not been treated by inexperienced hands but by gentlemen who are known to be high in the profession and especially in this branch. The condition of the muscles naturally is such that in some cases a tenotomy will benefit them. Buller said that he operated upon 110 cases, that there was a very little error of refraction or the eyes were emmetropic. Buller may not believe in the importance and necessity of correcting the very slightest degrees of error of refraction and he asked Buller whether in these cases the importance of an astigmatism of $\frac{1}{4}$ D. or $\frac{1}{8}$ D. has been taken in account. He found that these glasses go wonderfully where no other glasses would do any good.

Holt, of New York, said in talking with Buller a few days ago, he had occasion to speak of correcting hyperphoria and he told him that he seldom operated on a case that was less than 1 degree. His own best results have come in cases where the hyperphoria was less than 1 degree. He operates upon cases of 2, 3, 4 degrees. He does not mean to say he operates upon every case. In a case treated by one of the best men in Philadelphia the error of refraction had been carefully corrected for which she had worn glasses for several years. She had not over $\frac{3}{4}$ of a degree of hyperphoria for which she had worn prisms having had 6 or 7 pairs of glasses. He corrected this by cutting the center fibers of muscles, in July 1896. She returned last July saying that she was entirely relieved, using her glasses with perfect ease. He has not had many cases like this but now and then has some that lead him to look for small degrees of hyperphoria.

Marlow, of Syracuse, said in the first place in the examination by the Maddox test the degree of esophoria is larger than if we do not use red glass. This is due to the fact that the red rays are less refractive than other rays and consequently the difference is greater and we get increase of the convergence. Before deciding upon operation he examines the refraction and corrects the refractive error after mydriasis even to $\frac{1}{4}$ or $\frac{1}{8}$ degree of astigmatism. He also ~~examines these~~ muscles which appear to be lacking and relief can be obtained in that direction. He has used Gould's method of exercise but has not found the results claimed by those who have written upon the subject. In cases of exophoria he has raised the adduction to 5 diopters ~~always~~ correcting the exophoria by operation with satisfactory results. He

has found a great advantage from the use of prisms in cases of hyperphoria not only of low degree but of considerable extent. Certainly $\frac{1}{2}$ degree of hyperphoria in many cases gives rise to a great deal of discomfort. He does not operate until he has exhausted the refraction question and the question of muscular deviation by prisms. The bandage is a very important element. The eyes should not be occluded, in order to gain binocular fusion. In some cases placing prisms in front will make the eyes temporarily diverge. He has certainly been satisfied, as a rule, with the results of the operation in carefully selected cases.

Fryer, of Kansas City, asked Buller in the 100 cases reported of what number, if any, had any deficiency of the oblique muscles. He finds that this gives us quite as much if not more trouble than the recti.

Howe, of Buffalo, said with a carefully selected series made a number of years ago only between 1 and 2 per cent were found with the refraction normal. Until these are all corrected with certainty there is a reason for perhaps including some of them for operative cases which might otherwise be corrected with glasses.

Ryerson, of Toronto, has not operated very often and never operated on less than 2 degrees. He has had exceedingly good results and has had one result which was so good that he almost feared that in stating it he might be regarded as an enthusiast. Seven years ago a case was referred to him of a man who had attacks of epilepsy. He had but 2 D. of myopia and 6 degrees of hyperphoria. He corrected his myopia. He was having constant and severe headaches every few days. After very careful preparation and consideration he advised operation for hyperphoria. He did so and divided the muscles thoroughly. He made good recovery and he never had another attack of epilepsy. Hyperphoria is one of the causes of epilepsy.

Trow, of Toronto, had not done many of these tenotomies for slight hyperphoria cases and many agree that they are not required. He believes that the eye muscles are just the same as any other muscles. If they are weak they will show that weakness and if they require strengthening we must strengthen the whole body. Absolute correction does away with the little hyperphoria there is. A number of cases that he has seen that have been operated upon for low degrees of hyperphoria are much worse after the operation than they were before it. He reported a case of epilepsy in a little girl 10 years of age. The attacks were much less frequent if not almost gone after

correcting her with glasses. But when she took the glasses off or they were broken the attacks were much more frequent. While wearing the glasses they were very seldom and patient was in good health.

Buller, of Montreal, said what may be normal to one man is not normal to another, this must be taken in consideration. What is the normal standard? 5 or 8 degrees abduction or 25 or 30 degrees adduction? The relative proportion between these is very much the same and if a man is comfortable in his visual act with 5 degrees of abduction and 25 degrees of adduction after many trials of the strength of the muscles the evidence, so far as he is concerned, must be regarded as a normal condition. There are a number of people who cannot get an abduction of 8 degrees unless by long continued exercise. But up to the present time he has not been able to make up his mind that there is an absolute standard or he would work on it. He has found, however, that for esophoria there is a somewhat greater deviation by the use of the Maddox rod than by the Stevens' phorometer. He has no objection to doing frequent operation and getting very little effect at a time and repeating this operation as often as seems necessary to achieve good results if patients will submit to it. But he was quite sure if he would operate on patients many times they would leave him and he would never see them again. He never operates upon one muscle more than twice. He does attempt to correct every error of refraction and correct it as absolutely and completely as he knows how, and many patients cannot tell the difference between $\frac{1}{2}$ and 1 D. They may be smarter in other places, but not here. As regards the oblique muscles. The trouble in correcting them would be so great that it would not be worth while to try it. He has used a mydriatic in all his cases as he considers it is essential to use one of these drugs and where he thinks atropin is necessary he uses it in order to get the proper correction of refraction. People less than 50 years of age you cannot refract properly without mydriatics. He usually corrects refractive errors before any correction of the muscular faults. What need is there for prescribing glasses for patients who are not suffering sufficient to make it worth while to procure the annoyance of wearing glasses. He has not operated in all these cases where it was fair to assume that the headaches, etc. were due to a fault merely in the general health. If a person with a history of having headache for 15 or 20 years, is it not well to assume that it is the general health which cannot be so easily corrected? If you correct the refraction and your patient from that time on recovers from the malady which has pursued

him it is then fair to assume that the result was due to therapeutic measures.

Jules Jehin-Prume, M. D. of Montreal read a paper upon "**A Contribution to the Treatment of Syphilitic Eye Diseases.**" He spoke in a general way of the average case of syphilis from the initial lesion to the various manifestations of the tertiary stage, the treatment being always mercury, nobody pretending to change it, the argument brought forth in his paper being the best method of administration. The serum injections are alluded to but as a means to be used in the future and not fully tested as yet. The older modes of administration as Gilbert's syrup, protoiodide, subcutaneous injections, frictions and subconjunctival injections, etc., all having disadvantage, the first upsetting the alimentary tract, the sub-cutaneous injections, even when practiced with the most careful asepsis, producing abscess to say nothing of the pain in administration and the sub-conjunctival injections, after the effects of the cocain have worn off, are very painful for several hours. Frictions do not up-set the digestive organs as quickly nor are they open to the objections above mentioned, but the objection of the patient to applying a repulsive and apparently unclean pomatum to their teguments is one thing to be considered besides the mercurial affections of the skin and finally stomatitis. He praises intra-venous injections very highly having used nearly 2000 in his own practice and having but two cases of stomatitis. They act rapidly and if doses are properly regulated produce none or hardly any general symptoms. The administration of large doses is unnecessary as it goes directly into the circulation. There is no pain whatever and the operation takes hardly 2 or 3 minutes. The instruments necessary are a syringe, platina iridized needle, alcohol lamp, flannel bandage, hydrophyle cotton-wool, solution of alcohol or ether, colodion. The syringe put on the market by Wulfing-Lüer of Paris, being entirely glass and easily sterilized is the best as asepsis is essential in this method of treatment. The solution used is

Hydrarg. Cyanate	1.00
Aqua Dist.	100.00

1 cubic centimeter is used as follows, 1st. series, 20 injections, one every day, interval of 20 days. 2nd. series, 20 injections, one every 3rd. day, interval of 20 days. 3rd. series, 20 injections one every 4th. day, interval of 20 days. Last series, 1 injection per week as long as physician deems necessary. Objections and dangers are foreign matters, air bubbles, embolisms, thrombosis. The two former can no

longer exist with a suitable syringe and careful preparation of solution and patient.

Advantages of intravenous injection. It is painless, the quantity of mercury may be dosed rigorously, the rapidity of the cure, the inoffensiveness of the treatment and the patient is not kept from his daily pursuits.

Conclusions. Intravenous injection should be practiced only in serious syphilitic cases when immediate results are required. When other mercurial treatment has given no results or slight ones and the non-acceptance of other methods by patients.

Alt, of St. Louis, inquired concerning the exact doses of mercury.

Jehin-Prume answered, 1 cm. in a dose, varied according to the case, generally can be taken twice a week. Injections have been made many times in his own private practice even 20 or 25 times in the same vein. They have been found perfectly harmless.

Edward Jackson, M. D. of Philadelphia read a paper upon "**Foreign Bodies in the Cornea.**" He reported 10 cases in which foreign bodies has been retained in the cornea for longer than 3 weeks. The character of the foreign bodies varying from cinders, dry leaves, gold wire, glass, beetle wings, etc. In one case a woman carried a piece of glass in the cornea for two years and three months. He states that the presence of a chronic corneal ulcer should always awaken suspicion of a foreign body and lead to careful investigation. The foreign body becomes deeply imbedded in some cases and does not cause inflammation. The epithelium proliferating around and over it. Sometimes a foreign substance may stick on the cornea for many days, weeks or months without causing inflammation or uneasiness. In the reported cases the corneal ulceration healed shortly after removal of the foreign bodies.

Alt, of St. Louis, had two cases in which husks of grain had been lodged on the cornea for a long time: in one of which the time stated by the patient was over a year.

Würdemann, of Milwaukee, contributed two curious cases of foreign bodies as follows: 1. A man who had been hiving bees in August came to him in February of the following year stating that he had been stung in the upper eye-lid and since that time the eye had been sore. During the winter he had received treatment from two physicians without relief. Examination showed ulceration of the upper part of the cornea and eversion of the upper eye lid showed great conjunctival thickening and ulcer about the size of a small grain of wheat

in the bottom of which there was a black speck. Removal of this by forceps showed a small hair-like body, which magnifying glass proved to be a bee sting. This had remained in the eye 7 months and caused the corneal ulceration which rapidly healed after removal of the offending body. 2. A young lady had been in a dentists chair one week before consultation. She came stating that while adjusting a gold crown a piece had broken and flown into her eye. This had given her but little inconvenience and on examination a small piece of gold was removed from the cornea.

Randolph, of Baltimore, said he had been struck by the fact that in this discussion, the foreign bodies which have remained for a long time in the cornea and conjunctiva without causing inflammation have been for the most part the hulls of seeds and wings of insects, in other words, substances which possess little if any irritating chemical property. We have in Baltimore an affection called oyster shucker's keratitis. This affection is produced by an injury from a minute particle of the oyster shell which is violently detached in the shucking process. It is a well known fact that minute particles of sand, grit, cinders etc. may remain for days in the cornea without giving rise to inflammation but an injury from a small particle of the oyster shell will produce infiltration of the cornea at the point of injury within twenty four hours afterward and accompanied with marked subjective symptoms. A bacteriological investigation of a large number of these cases failed to reveal any specific organism to which this violent and prompt reaction could be attributed. He was forced to the conclusion that the keratitis was probably due to the one or more irritating chemical ingredients of the oyster shell and among which the carbonate of lime plays the most prominent part. The freedom then from irritating properties probably explains the absence of inflammatory symptoms in such cases as have been reported by Jackson and Würdemann.

R. L. Randolph, M. D. of Baltimore read a paper upon "**A Preliminary Communication as to the Value of Salicylic Acid Ointment in the Treatment of "Spring Catarrh."**" Randolph spoke of the futility of the methods usually employed in treating Spring Catarrh and reported three cases in two of which a cure had apparently resulted from the use of an ointment of salicylic acid and lanoline, and in a third case the improvement was so marked as to warrant the hope of a speedy termination of the disease.

The first case was a negro boy five years of age who had been affected for a year with all the characteristic symptoms of the disease.

The ointment was at first used in the strength of six grains of the acid to the ounce of vaseline, but later on lanoline was substituted for vaseline. This was rubbed into the eyeball by massage through the lids twice daily and in two weeks the symptoms had entirely disappeared and so far as can be learned have never reappeared. That was nearly three months ago. The second case was a boy seventeen years of age who had had the disease several years and who had been treated in all of the eye clinics in Baltimore but with no benefit. The ointment was used in the above strength for a few days and then it was made stronger (ten grains instead of six grains of the salicylic acid being used.) In a month he was practically well. In both these cases the changes were confined to the conjunctiva of the eyeball and were located at the upper and outer border of the cornea. The third case was a boy twelve years old. In this case the changes were confined to the tarsal conjunctiva of the upper lids, and consisted of flattened, pavement like vegetations which sprung from the conjunctiva. They were cartilaginous in consistency and pale in appearance, indeed there was a noteworthy absence of congestion of the conjunctiva anywhere. Here the ointment in the strength used in the first two cases produced no effect and it was not until the strength had been increased to sixty grains that the nodules began to disappear and now an ointment of the strength of seventy five grains of the acid to the ounce of lanoline is used once daily. Cocain must be instilled several times before using this ointment which latter is applied on the end of a mop made by wrapping the point of a toothpick with cotton. The ointment should be rubbed in vigorously even if bleeding be produced, and it should be done faithfully every day. Before the adoption of this treatment the usual remedies had been tried on this boy but with no benefit. His left eye has only a few nodules left and the other eye is not far behind in improvement. This after two months treatment. In all these cases the prompt disappearance of subjective symptoms (itching and burning) was striking. In the first two cases the patients complained of some irritation after the use of the ointment but this did not last long. Dr. Randolph emphasized the fact that in those cases where the disease showed itself in the tarsal conjunctiva the ointment must be applied by the physician as the patient would be unable to evert the lids and rub in the ointment effectively. He spoke of the value of salicylic acid ointment in chronic affections of the skin and the prominent position which this variety of ointment occupied in the armamentarium of the dermatologist, also of the man-

ner in which the ointment acted and concluded by saying that although it was too soon as yet to draw positive conclusions as to the value of the treatment it would seem that this method lent to the prognosis of vernal catarrh a somewhat brighter aspect.

The President said there is sometimes difficulty in distinguishing this form of conjunctivitis from trachoma. He saw a case this summer who had a good family doctor and which had been treated a great deal by several ophthalmic surgeons as trachoma and had been kept out of school on account of its supposed contagiousness.

Reeve, of Toronto, said in the worst case of this sort that he had seen where ordinary remedies had failed under chloroform anesthesia he had scrubbed away all the redundant tissue. The cornea seemed quite small before that, the eye being sensitive and weak. After the operation the cornea seemed of a normal size. At the time of the operation there was no reaction. Patient remained well for a year and returned a few weeks ago being treated in the same way, the improvement being almost magical.

Randolph said two of these cases were very well known among the ophthalmologists of Baltimore. They had gone the rounds and made their appearance every spring. The subjective symptoms disappeared entirely in the early part of the cold weather.

G. H. Burnham of Toronto, read a paper upon "**The Hypodermic Use of Pilocarpin in Eye Disease.**" He gave a brief sketch of a man, suffering from rheumatic inflammation of both eyes of at least three years duration associated with well marked chronic articular rheumatism. In each cornea there was a number of closely placed small infiltrations occupying an area larger than the pupillary area with the rest of the cornea clear. The infiltrations of the left cornea were undergoing undoubted calcareous degeneration. There was also slight affection of the iris and vitreous of each eye. R. eye V = a few letters of No. XX Sn. type for distance at eight inches. L. eye V = a few letters of No. XV of same type at eight inches. He had previously to consulting him been under the care of specialists and taken almost every variety of medicine. He was at once given hypodermic injections of pilocarpin. In three weeks there was an improvement. Under this treatment continued every six to eight weeks during the latter half of 1890, 1891, 1892, 1893 and up to June 1894, there was an uninterrupted improvement till at the end of this time the vision was $\frac{2}{3}$. He is now very active, being able to run up and down ladders quite swiftly and the vision is still $\frac{2}{3}$. There has been no relapse. He also gave a

brief summary of a case of acquired syphilitic irido-cyclitis of both eyes, which had been under treatment with mercury and iodide of potassium internally and atropine locally for nine months prior to consulting him. The eyes had steadily grown worse, till the vision when examined by him was R. eye a few letters of Sn. type No. XL. L. eye p. l. only. There were in each eye large posterior synechiae and lymph in the pupillary area. In this case the combined treatment, that is, mercury and iodide of potassium internally and pilocarpin hypodermically caused immediate improvement and at the end of nine months the vision was R. E. $\frac{3}{8}$ L. E. $\frac{3}{8}$.

The third case was that of a man with severe gonorrhoeal irido-cyclitis of each eye, with copious effusion of lymph into the pupillary area. Here the combined treatment was followed by excellent results. At the end of 3 months the vision was $\frac{3}{8}$ mistily but correctly.

Burnham looks upon this combined form of treatment as exceedingly valuable and reliable. He has also used it to a limited degree in other affections of the eye with equally good results and thinks it ought to be very efficient in cases of sympathetic ophthalmia. His solution is muriat-pilocarpin 5 gr. to 1 dr. The dose varies from gr. $\frac{1}{2}$ to gr. 1. He gives the injections in groups of from 7 to 10, sometimes as many as 14 for the first group with intervals of six to eight weeks. He gives it as a rule every day, occasionally, however, skipping a day. The patient is always put to bed in blankets, with temp. of room 75° . He lies with his head upon a low pillow, and a mug held by himself to his mouth to catch the saliva which freely flows. He, thus is able to remain very quietly in bed and stays there for $1\frac{1}{2}$ to 2 hours. At the end of that time he gets up and is wiped down with a warm towel. The injections are given in the afternoon and the patient does not go out till the next day. It is very necessary indeed to follow out an exact routine while giving the injections, otherwise there are symptoms more or less alarming and which interfere with its proper use and effect. He also spoke of the necessity of persistence in its use as long as there was an improvement, in order to get the full and best result.

Fryer of Kansas City, confirmed the general experience of the speaker, having used it very frequently in hemorrhages of the retina and sympathetic ophthalmia. His method of administration is similar to Burnham's. He puts the patient in bed for a day after each dose, beginning with 1-10 or 1-8 of a grain increasing until a grain, giving in connection small doses of alcoholic stimulants. In most instances

there is slight flow of saliva and increase of renal secretion, in a few, acute vomiting occurs. In most cases there is little or no reaction. It is important to keep the patient absolutely quiet in bed. He had seen vitreous opacities removed and improvement in sympathetic ophthalmia and had found large increase in visual acuity by continued use of the drug. He believes it should be given for a time, then stopped and then taken up again.

Alt of St Louis, supported the ideas of the essayist. He has had a number of disagreeable experiences in the use of pilocarpin which have prevented him from using it as frequently as formerly. He has quite a number of cases which have been treated for a continued time with pilocarpin injections, in which the opacity did not clear up but in which he had good results afterwards. In syphilitic cases he prefers corrosive sublimat to pilocarpin. He cited a case of a young girl who had lost one eye and who had detachment of the retina of the other which was very myopic. He treated her with pilocarpin injections and on the 7th or 8th day menstruation occurred for the first time. The retina became reattached and has remained so for eleven years.

Mittendorf of New York, said in regard to the tolerance of the drug in different individuals, he has come to look upon this drug as his chief reliance in cases of opacity of the vitreous and especially if associated with detachment of the retina and has given it in very small doses and has continued it for a long time. He has tablets made, 1-100 part of a grain and has these pills taken one three times a day giving directions to the patient not to take much fluid, dress warmly, and not expose themselves to taking cold; and he has noticed where after the continued use of this drug for several days faint feelings have come on, so that the patient had to go to bed. If this dose is used it may be continued for months in the majority of cases.

Holt of New York, said since Mittendorf gave his method of using pilocarpin in detachment of the retina, 15 years ago he has conscientiously used it and has cured several cases of detachment of the retina. The first was a case of 8 or 9 D. of myopia in 1884. The lady was one who traveled about the country and consulted several men who did not use any treatment. He began the use of pilocarpin according to Mittendorf's directions and at the end of about 10 weeks the tumor began to absorb and completely disappeared. He has seen the lady every year since. She has good vision in the eye and has no trouble. This case had been seen by several prominent men and they thought it was of no use to try to give any treatment. He has had

several cases since that and used Mittendorf's method but since then he has used the nitrat of pilocarpin in 1 per cent. solution for a long time by injecting the drug but found in some cases it was very annoying. He has given it by the stomach and has equally good results. There is certainly a beneficial effect in giving it with mercury and iodid of soda.

Williams of Boston, had two cases of episcleritis in which the injection of pilocarpin, beginning in 1-6 grain, seems to have given satisfactory results. It seems always best to make the solution fresh for each injection and make sure that it is thoroughly sterilized. He remembers having seen an abscess following pilocarpin injection into the arm, which was very slow to heal and which seems to him to have been due to the solution not being sterilized.

Trow of Toronto, said since seeing several cases in the same hospital under Burnham he has used pilocarpin in the same way as Burnham with favorable results.

Burnham of Toronto, found no necessity of keeping the patient continually in bed. The routine in regard to pilocarpin is very important and not to be deviated from until you have a decided effect and you have symptoms which are characteristic. He gives no alcoholic stimulant. He has never given pilocarpin in large doses. If excessive flow of saliva results, pilocarpin has been mal-administered in some way or other. Women are more particularly affected by pilocarpin than men. It is very necessary to let them lie down with their head on a thin pillow and keep them thoroughly covered. He makes them lie in bed and stay there two hours. When they get up they are to be wiped down with warm towels or they will suffer. He lets them go out the next day and take exercise and never has any trouble. He warns them to walk about quietly. He stops treatment for a length of time and begins again in about 8 weeks, when the patient comes more often the progress is very much more satisfactory.

Alt of St. Louis, said he has employed the same method. He had only one case in which he had to stop it. He insists upon the treatment in connection with other drugs. In vitreous opacities you see them gradually fade away, becoming thinner, which shows you the marvelous effect of this drug. The danger of forming of abscesses by injecting is very small. He dips the needles into 2% solution of carbolic acid before putting it in the second time. He has never had an abscess and has used the same solution for 7 or 10 injections.

Holt of New York, has used the plan recommended by Mittendorf and kept his patient in bed, then massaged every day, not going out of the room and for weeks in the house. She lost a number of pounds.

The President had a man with complete detachment of the retina, high degree of myopia and no light perception in either eye. He used pilocarpin in his case and the result was satisfactory. He could read large type but he could not say if he would hold that. When you are treating a case of detached retina do you keep the patient in bed a long time? *Holt* answered that he was not fond of keeping them in bed.

C. H. Williams, M. D. of Boston, in a report on "**Simulated Monocular Blindness**" and "**Instruments for Testing Color Perception.**" Showed tests for simulated monocular color blindness, one of which consisted of a trial frame containing two Maddox rods. One at 90 degrees and the other at 180 degrees with red glass behind one. If the patient saw a cross composed of a red line crossing the white, he has binocular vision and colors may be used to distinguish the eye with which he sees if there is only monocular vision. He also showed cards of numbered letters in light red and light green on a gray background. The reversible frame with red and green glasses is used. The red letters of course are not seen through the red glass, nor the green through the green glass. In simulated color blindness he uses the Holmgren worsteds, having the colors tagged.

T. H. Bickerton, F. R. C. S. of Liverpool, contributed a paper upon the "**Question of Color Vision in the Mercantile Marine**" which was read by W. H. Smith, M. D, of Winnipeg. He showed that in color testing it was necessary to use colored lights at a distance shaded by smoked glasses in order to evolve conditions similar to those met with by pilots and engineers in their work. The Holmgren test by wools is not infallible.

Williams of Boston, said there are a few things necessary in testing for the color perception, one is a comparison test with a large number of colors, which will show whether the perception is lessened for red or for green. It is very necessary to have a transmitted light through a small measured opening in every case. This has been done for some time in his services. He then exhibited a comparatively simple instrument for transmitting light through measured openings, presenting conditions met with in actual service giving small retinal images which would shut out cases of central scotomata due to tobacco and other causes, in which the periphery had good vision. In

this instrument red and green lights were used which could be modified by smoked glasses. The sizes of the lights could be varied and the colored glasses used in railway service could be inserted.

Thomson of Philadelphia, said the effort to protect the railways from defective employees on the Pennsylvania system has been perfected and the officers of the road are so well satisfied that he has been unable to bring them to have re-examinations made. In order to learn by recent testing how many of the old employees have fallen below the standard. The original tests were made by the improved wool test, the methods of using which are fully described in his recent article in *Norris & Oliver's System of Diseases of the Eye*. In 1894 he sent circulars to the roads of America, the statistics of which have been published. 24 used the Thomson test; 38 Holmgren's; 31 made no test and 34 no response. At that time the roads using tests covered a mileage of 46,000 miles. The new wool test was sent to the railways and it must have had the effect of calling the attention of the officials to the necessity for examination, for when he inquired in 1896 he found that there were 78 who used the new wool test, making a mileage of 106,000 miles with about 180,000 employees. It is a fact that many railroads have no system of examination and it is necessary for the profession to urge all the railroads to use some system of protection against defective eye-sight and defective color vision in their employees.

Mittendorf of New York, said in this country, next to Thomson, nobody perhaps has made as many examinations for color blindness as he has. He has the New York Central under his control and although they have not so far extended these examinations to the brakemen and conductors yet there is not a single engineer or fireman that has not been examined by him personally. The results of his examinations have been so nearly in accord with the report of the British Medical Association, which was published a few years ago, that he has really little to add to it. He emphasized the fact, that the simplicity of the test where a large number of persons are concerned, is of the utmost importance and he has been obliged on account of prejudice to return to the Holmgren wools. If you take the stick you can keep a much better record of it, but we must not forget that some men are exceptionally nervous and in testing they are so confused that they are much more liable to make a mistake simply from being nervous than from being actually color blind. Another is that we should have means of bringing these different colors in shape of signals before the

eyes of the man to be examined in as rapid and quick a way as possible. For this he has used round signals of the size of lenses, taking a piece of the flag in actual use and putting it on the stick and he should answer at once whether the color was the red, green or blue. He further agreed with the report of the committee that a great many persons will sometimes make a mistake between blue and green without being actually color blind and this is simply a matter of want of education. Returning after a little while they will always be able to distinguish between green and blue. He has examined between 5000 and 6000 men, not a single man returning after a long time who was able to pass the examination after the first. He has had these men come with a satchel full of worsteds with which they were familiar and they can pick out any of the colors to match but if a larger assortment is taken they fail completely. It is a very important fact in these examinations, if you have a large number of older employees who have been running for years without causing any accident to convince them that these engineers are color blind and for this the Holmgren test is the best. It is known that re-examinations should take place, because in older persons it is not so much the perception of color as it is the acuity of vision which diminishes. He has seen patients who had lost at least $\frac{2}{3}$ and would make no mistake in color perception. Another point is that we must sometimes convince old employees of their inability to see the signals well, especially in foggy weather and therefore we should use the method of Williams. It has been arranged on the New York Central System that if any of the engineers passes a signal that he has to be examined the next day to find out why he passed the signal, whether it was carelessness or whether defect of vision or imperfection in color perception was the cause. This is compared with the examination on record and we know at once whether the man has lost vision or not.

Fryer of Kansas City, said he has examined a large number of railroad employees for color perception and thinks it is important that the railroad ophthalmic surgeons should urge upon their corporations the necessity of a re-examination at stated times from 2 to 3 years as the case may be. Many of these men are large users of tobacco. Their visual acuity and color perception should both be tested at intervals, after the first examination, of 1 to 3 years. Not longer than 3 years should elapse for second examination. A man should study the cases so that he covers not only examination of color perception but of the eyes and that it should be as thorough as possible including examination of the

visual field and color perception. This instrument of Williams is very useful.

Alt, of St. Louis, said although, of course a firm supporter of the examination of railroad employees he has been unable to impress the railroads with the importance of such an examination. No man is examined by him or any other oculist except if defect is noticed and then they are sent usually with a letter in which he is mildly asked to give as favorable a report as possible. The statement made to him is, that these men have been with them so many years and are valuable employees. If they should now begin to reject men simply because they are color blind they would be doing a great injustice to men who have done service for many years.

Mittendorf, of New York. Since the introduction of this careful examination on the New York Central we have had very few accidents either to freight or passenger trains.

Burnham, of Toronto, said he knew an engineer who had been running for 35 years without ever having had an accident and had never run past a signal. One day he made a break in the record. He was examined and found to be color blind. The fireman was examined and was found to be normal. The authorities did not until that time know that the engineer was color blind.

Mittendorf, of New York. The engineer depended upon his fireman for the recognition of signals.

Rivers, of Denver, asked if any one present had met with cases color blind in one eye and normal in the other. He has not examined as many men as Mittendorf. In the Denver & Rio Grande system all new applicants regardless of their position are subjected to rigid examination not only in regard to acuity of vision but must also be perfectly healthy. These are the only class of people employed. He examines each eye separately and never found anyone who was defective in one eye and not in the other.

Calhoun, of Atlanta, asked Mittendorf and Williams to what extent a man has to be color blind to be rejected by their railroads. In his section of the country the railroads have come very slowly to the examination of their employees. They say, that many employees are old and have been in their employ so long and never have had an accident, which is good evidence that they are all right.

The President said there have been few cases of single eye congenital color blindness. They are very rarely found which may be due to the fact that they have not been looked for on a large scale.

Thomson, of Philadelphia. In the use of the new wool test, the instructions to the operators are to test each eye separately. There are no means of telling how these instructions are carried out.

Rivers, of Denver, has examined all eyes separately. Has not found a one eye case yet. The company have not required that all the men on the road should pass this examination but require every man, woman and child that applies for a position to take the examination before they are employed.

Mittendorf, of New York, in all examinations made has examined the eyes separately and he thinks that if a single eye is color blind it must be a pathological condition. The examination includes only the firemen and engineers.

Williams, of Boston, was for about 6 years the medical director of the Burlington Road, 7,000 miles of track and 5,000 men on the road, so that there was quite a large body. They did not undertake to examine everybody in the service but made it a rule that no one should come into the service in any department, especially where there was anything to do with colors, who was unable to pass the standard medical examination. These examinations were all made by medical men of course, i. e. they were not left to the clerk in the superintendent's office, who might make them in a poor way without testing the applicant as carefully as ought to be done. These reports were all recorded and sent to him for approval, so the report of every examination went under his eye and with the number of the worsteds. If the railroads generally do not have these examinations, a man will be rejected on some road which requires the examination and then simply goes to the next road that does not require an examination and gets a situation. Now the need to-day is to start with a proper method for examination, which applied not to the old men but to new men coming into the service and a man who is in the service and is found defective need not be discharged from duty but provision can generally be found for faithful men in some place and at the same time need not be a danger to the public and their fellow employees. If you can institute a good plan which has sufficient safeguards and is practical and which will meet with the approval of the railroad officials we shall get ahead much better and quicker than when we try to go too far at the start.

Proudfoot, of Montreal. In the Canadian Pacific Railroad a case occurred a short time ago. A man who was connected with the shunting, to the surprise of everyone allowed one of his trains to get off

the track. He said the lights were not all right but they were. They did not appear right to him. On examination he found that the man was not only color blind but had only 13 vision. He wrote a letter stating these facts and that the man should be put into another part of the service. They gave him some other employment where he was out of danger.

Burland, of ————. The organization in the South called Local Surgeons of the Plant System of Railways has carried out a magnificent scheme known as Hospital Relief and Fund System which is worthy of notice. This has hospitals attached to it and every new employee has to pass a thorough medical examination. His life is insured against accident and disease. But in these examinations, made very thoroughly by the local surgeon of the road the question of eye trouble, color blindness and defects, etc. is not left in his hands but such a case is sent to a specialist or oculist of that system and examined in this respect before entering into any position that requires his vision to be perfect. The system covers 5,000 employees, 2,500 miles of track. The Thomson system of color examination is used.

Howe, of Buffalo, said one of those who applied at the eye and ear infirmary was entered simply as a railroad employee and was treated for granular conjunctivitis. He had perception of light with one eye and vision equal to counting fingers at a distance of 8 to 10 feet with the other. The man was a switchman and his perception and ability to recognize the signal flags was so slight that he depended upon his ability to recognize the different tones of the whistle and bell. By the way, he was on the New York Central railroad. Such persons should be eliminated from the service of the railroad.

Jehin-Prume of Montreal, said it is the custom of the railways of France, Belgium, Germany and Italy to examine employees regarding their vision and color perception.

H. V. Würdemann, M. D. of Milwaukee, read a paper upon **“Relation of Skiascopy to Other Objective and Subjective Tests for the Estimation of the Ocular Refraction with Exhibition of Instruments.”** Skiascopy is without doubt the most accurate of the objective methods for determining the ocular refraction. The cases in which it can not be practiced are exceptional, being those in which a definite visual zone cannot be isolated, although in such cases as in irregular or conical cornea, in partial lenticular or corneal opacities and in very high grades of astigmatism, skiascopy is of great value as a confirmatory test. All of the objective methods, keratometry, direct ophthal-

moscopy and skiascopy have their special field and all are essential to the proper measurement of a refraction case no matter how simple. The ophthalmologist should not confine himself, like the jeweler or optician, to the trial case and practically allow his patient to choose his own glasses, but should *measure the eyes*. In skilled hands, skiascopy gives the most accurate results of all methods not excepting the subjective tests. By the use of the several objective methods the time spent at the trial case is reduced to a few minutes; the proper measurement is placed before the patient's eyes at once and the test by trial lenses is reduced to but a confirmatory test. The confidence of the patient is assured, better work done and time saved by using these methods. In skilled hands skiascopy is of inestimable aid for the measurement of those low grades of astigmatism so commonly needing correction among the educated American classes. Exhibition of hand skiascope and other appliances with method of use followed.

Williams, of Boston, preferred the placing of lenses in the trial frames to most forms of instruments as he used cylinders in the examination. Where only sphericals were used the hand skiascope is valuable. He asked how the shadow test compares in accuracy with the examination by the upright image. As the Javal ophthalmometer gives simply the surface irregularity of curvature we need a test which gives all the ametropia. In a great number of cases there is an astigmatism due to lenticular astigmatism.

Fryer, of Kansas City, was pleased with the essayist's paper and very glad he had called attention to the matter in general of skiascopy. He believed that one cause of its not being generally adopted, is due to the confusion that oculists get from trying to use both mirrors, the concave and the plane. The simplest way is to adopt one or the other mirror. The plane mirror carries with it all simplicity. Make the patient 1 diopter myopic and examine at one meter. It is certainly a simple and exact method.

Jackson, of Philadelphia, showed a trial frame with the front arranged so that the angle can be read while the test is made. It is not numbered in any way but the divisions of white and black are plain and the operator is thus not liable to get confused as to what each one means. Where the principal meridians are oblique, the vertical and horizontal lines give sufficiently accurate measure so that he can estimate within 5 degrees. As regards accuracy, the shadow test is very decidedly superior to the ophthalmometer. The shadow test will not mislead you. The finding of the ophthalmometer may be perfectly

definite and yet the total astigmatism may be greater or less or have a different axis. He cited a case that showed 1.50 of astigmatism in the usual directions with the ophthalmometer and it came out something less than 1 diopter but at 135 and 145 degrees. Sometimes anyone will be mistaken from a single observation of an eye with the shadow test, several may be necessary. The shadow test is more accurate than the upright image although he had a mirror made with a sight hole of 5 mm and 7 mm. He could not do accurate work with it. He has never thought that he could go beyond the limits that Loring suggested and measure less than .75 D. astigmatism. In very many eyes it is possible by the ophthalmoscope to be more mistaken than that. The determination is more accurate with the shadow test. For a great many eyes you can get no such accuracy. It depends upon the refraction in different parts of the pupil how exact you can make your measurements. There is no way that we can tell which part of the pupil the patient sees through except with the trial lenses. If the refraction is comparatively uniform then skiascopy is accurate.

The President said the shadow test is now used in England very generally. In Moorfields, the surgeons were relying very much on the shadow test. He does not use it much as he began very late with it and has not taken it up with enthusiasm. In London comparatively few use the ophthalmometer. He has not very often come across men who use the two methods. One man uses one by preference. Jackson speaks from experience and what he has said shows that the shadow test is much the better of the two. The shadow test does not take very much time. In regard to the question asked by Williams as to the relative accuracy of the shadow test. Anyone who does the shadow test with any degree of accuracy, would come to the conclusion very quickly that the shadow test is much more accurate in giving the direction of the principal meridians and degrees of astigmatism than the ophthalmometer. He uses the ophthalmometer. He is quite sure that the shadow test is a convenient method.

Würdemann, of Milwaukee, closed the discussion stating that Jackson had answered most of the questions raised and had sufficiently elaborated points not fully developed within the limits of his paper. He was pleased to learn from the honored president that the shadow test was again being used by the working ophthalmologists of England. As regards its accuracy he thought there could be but one opinion. Its usefulness depended upon the man with the mirror. In his hands it was ordinarily accurate to .25 diopter in astigmatism as

regards amount, but only to 10 degrees or 15 degrees as regards axis. If tired or over worked, his personal error of equation was much greater and then perhaps even .50 might be allowable. In exceptional instances an accuracy of .12 was possible. If the visual line of both patient and operator practically coincides, there would be no question but that skiascopic correction thereby obtained would give the best obtainable vision.

Abstract of paper by A. A. Foucher, M. D. of Montreal upon **"The Etiology of Dacryocystitis,"** read by J. Jehin-Prume, M. D. of Montreal. There exist numerous causes of dacryocystitis, but its principal element lies in the unhealthy constitutional state of individuals. This conclusion is arrived at after the study of 273 cases. The adjuvant causes, inflammation of the adjoining parts, change in pathologic character of secretion passing through ducts being brought about by debilitating diseases, i.e. variola, tuberculosis, syphilis, etc. Women are more prone to the affection, being of a weaker constitution, are more often ill, pass through critical periods, menstruation, parturition and lachrymation, uterine troubles and menopause, all of which affect the lachrymal ducts more or less to say nothing of the impressionable nature of woman and the very frequent causes which act by reflexion on their lachrymal ducts. Apart from this, the system being prepared by some constitutional unhealthiness or another, interior and exterior infections are favored. Circumstances being now propitious to the production and cultivation of organic microbes and the organism being powerless to render the evil certain, diathesisical manifestations appear and among them we classify dacryocystitis.

Holt, of New York, said one of the causes of dacryocystitis is the using of the eyes for close work too constantly. While in Europe in 1887 he asked every man his opinion of dacryocystitis and his idea as to the cause and got a very large variety of opinions. At that time he had cases where they would have repeated abscesses year after year and upon carefully examining quite a number of these cases he found they had an error of refraction and after he had properly corrected the error of refraction they never had repeated attacks of abscesses. Of late years he has prevented a number of cases by paying attention to correcting the error of refraction. He has very definite treatment in regard to these eyes. He gives ether and uses Theobald's probe and a piece of lead made at the time to fit the canal and leaves it in and has no more trouble with the case. He generally leaves it in for two months but sometimes has allowed it to remain for two years.

Jehin-Prume, of Montreal, said electrolysis with a small wire electrode guarded by rubber insulation will cure some cases. Treatment is given every two days; graduate strength. He had three or four cases with very good results. It should be tried where other methods fail.

Proudfoot, of Montreal. It has been mentioned that a very large majority of females are afflicted with this disease as compared with the male. This is very remarkable. He was connected for many years with the Montreal dispensary and in that institution very few men were treated for this disease as compared to females.

A. Proudfoot M. D. of Montreal, read a paper upon "**The Value of Weak Lenses in Certain Cases.**" Made a strong plea for the use of weak lenses in certain cases. That while owing to occupation, environment and heredity, eyes are more prone to errors of refraction. Our increased knowledge and facilities for relieving these errors has more to do with the increase in the number of glasses worn than any actual degeneration of the organ of sight. He has found in a great number of his patients, who have suffered from headaches and other nervous affections referable to the eyes, an error or from .25 to 1 D., this together with the peculiar temperament, occupation environment and health of the patient, producing reflex irritation sufficient to cause disturbed vision and affecting general constitutional conditions. Great care is needed in discriminating. These same persons in an active out of door life or a sedentary life requiring no taxation of eyes would not need the slight error of refraction corrected, but place them under the unfavorable condition of occupation, environment and health and later symptoms of eye strain will appear. Again these errors may not be complained of until an attempt is made to use the eyes after convalescence from some severe illness. The attendant headache and pain in eyes being attributed to the state of health rather than the defect in the eyes. He cited a number of cases in which everything had been tried without relief and weak lenses properly worn had solved the problem.

Noyes, of New York, suggested the introduction of the word "exceptional" cases in the title of the paper, admitting the facts presented he would say that the habit of ordering weak glasses would tend to carelessness in diagnosis and neglect of other conditions which might be the real cause of complaint. There are cases of extreme susceptibility to refractive errors of a low degree just as there are cases of extreme susceptibility in the use of medicine, as for example,

minute doses of quinine must be given to certain people in the place of the average dose. * But to be satisfied with the prescription of a weak pair of glasses, .25 or .50 D. or plus cylinders is only justifiable after a very thorough and exhaustive examination. It shall include all possibility of eye trouble, in muscles, in conjunctival irritation, in central scotoma and other possible conditions, besides the careful inquiry into the general health and hygiene, habits of life and mode of using the eyes. Under these limitations one will naturally find a patient of whom the proper prescription is a weak glass, either to be permanently worn or to be used in near work. This same idea has already been emphasized especially by Chisholm of Baltimore but he put in a plea for its exceptional and unusual applicability.

Jackson, of Philadelphia, agreed with Noyes. The greatest relief is afforded by moderately weak convex glasses of .75 or 1.00 D. and perhaps a still larger part are relieved by teaching them to use their eyes to good advantage.

Proudfoot, of Montreal, said he had presented these cases as exceptional. Those with which he was most particularly impressed were cases that have been sent to him from other physicians who have tried the patient for some length of time with glasses for relief of the headache and nervous symptoms.

Thanks were then extended to the president and other officers in remarks by Howe of Buffalo. The meeting then adjourned.



THE OPHTHALMIC RECORD

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NO. 10, NEW SERIES.

EDITORIALS.

THE SECTION OF OPHTHALMOLOGY AT THE MONTREAL MEETING OF THE BRITISH MEDICAL ASSOCIATION.

It is a matter of regret that with the exception of the Chairman not an English ophthalmologist was present at the meeting of this section. Under the skilful guidance of Mr. Nettleship the work of the section went on admirably. No opportunity was given for presenting individual views on cataract for on this subject only one paper was read and that dealt with "Experiences with Cataract" and the Chairman wisely decided that such a paper did not call for a long and general discussion of the subject of cataract, a subject which offers an irresistible temptation to talk, for rarely do we see the end till every man has had his say. It is apparent that a truer conception of the principles of antisepsis and asepsis as applied to the eye prevails than formerly. The days of weak sublimate solutions seem numbered and asepsis rightly gets the credit for the success which for so long has been ascribed to antisepsis. The subject of the hypodermic injection of pilocarpin in certain affections of the eye commanded attention and brought out not a little discussion. Sympathetic ophthalmia and retinal detachment were mentioned among the diseases as signally benefited by this method of treatment, and it was somewhat startling to hear the glibness with which cases of retinal detachment were reported as cured. A patient with double retinal detachment and complete loss of light perception was restored to the power of reading large type. In justice to oneself one should always go fully into details when reporting unique cases. Clinical experience the world over has relegated a case like this to a class which is irremediable and the anatomical changes which are present in such an advanced stage of the dis-

ease would seem to warrant this classification. Since the use of salicylic acid ointment in the treatment of "Vernal Catarrh" the prognosis of this disease may be said to have assumed a brighter aspect. Judging from the value of salicylic acid in chronic skin affections, the hope at least may be expressed that we have found a "good thing," though as yet it is rather soon to speak positively in its favor. There was quite a thorough ventilation of the subject of color sense in its bearing upon the railway and marine service, and while much that was said in this connection showed an advance in the refinements of the tests it is doubtful whether any one suggested a substitute which will be found preeminently reliable and at the same time practicable. Retinoscopy has been steadily making its way and instead of being on the wane in England as many of us think over here, it has practically superseded other methods in the large eye hospitals in that country and is used universally in private practice. It is clear that the method possesses decided advantages over the ophthalmometer. A number of clinical communications of more or less interest were made, and rather pretty anatomical specimens were exhibited. The work then was interesting throughout but the delightful recollections of the beautiful city and its hospitalities will remain long after what was said and done in the meetings has been forgotten.

R. L. R.

OPHTHALMOLOGY IN MEDICAL COLLEGES.

In the August issue of the *OPHTHALMIC RECORD*, as an indication of the improved status of ophthalmology in the medical curriculum, a synopsis was given of the thorough examinations which the senior students of the Medical Department of the University of Pennsylvania must pass in this branch of medical science.

In this connection a brief mention of the methods of ophthalmic teaching in the *Jefferson Medical College* may be of interest: The attendance of the students of the third and fourth years upon the didactic and clinical lectures, each occurring once a week, is compulsory. Every afternoon the students of the fourth year, divided into suitable sections, are required to visit the Dispensary for Diseases of the Eye where they receive practical instruction in the functional testing of the eye, refraction, the diseases of the eye and ophthalmoscopy. They witness the operations performed in the clinical amphitheatre and private

operating room, and have the opportunity of attending quizzes on ophthalmology and demonstrations of operations on animals' eyes. In addition to the lessons in practical ophthalmology itself, the attention of the students is constantly directed to the relation of ocular symptoms and diseases of the eye to general diseases. Altogether eight hours weekly are devoted to ophthalmology—two to lectures and six to practical work in the dispensaries. These hours are exclusive of special lectures and demonstrations. At the close of the session the candidate for graduation must appear before the Professor of Ophthalmology and pass a thoroughly satisfactory examination upon the work of the preceeding year.

AMBLYOPIA.

If there is any science in the practice of medicine it should be in the department of ophthalmology, in which, nearly all the examinations are made objectively, and yet particularly in the subject of this editorial, amblyopia we find very diverse views among ophthalmologists. Under these circumstances the writer has felt that a free discussion, without prejudice, might in some way settle this question, but in order to do so we should understand the terms, Amblyopia Ex anopsia and that of amblyopia congenitalis.

Foster's definitions of these two terms cannot always be reconciled with the present observations of oculists, while those of Dr. Laertus Connor, in a paper read before the Ophthalmic Section of the American Medical Association, in his conclusions, places these two terms in a very practical light, but can we not accept these conclusions and yet at the same time, define exactly what we mean by the above terms? or in other words; can we not "draw the line" between the congenital condition and that caused by non-use?

I have, clinically for some time, endeavored to settle this complex question and have tested and watched my cases for several years and today I cannot recall a case of congenital amblyopia in which I have seen any improvement of the vision, either with glasses or after an operation, while on the other hand, I have seen cases that I have considered should be classed as diminished vision—due to non-use—which have materially improved under the use of glasses or after an operation.

In reference to amblyopia congenitalis I do not believe the brain has any part to play in the dullness of vision any more than I believe

n the innervation theory of squint, as I do not believe the visual impressions on the cones of the retina are transmitted to the brain, but that the fault lies in the retina itself and consequently the brain does not inhibit the visual centre from receiving these impressions. Why this should only occur in the one eye and the vision of the other be perfect we cannot explain but we know it to be a clinical fact.

Let us then define amblyopia congenitalis as a condition of the retina in which we have deminished vision of $\frac{2}{100}$, or less, with or without the correction of any existing error. This may or may not be associated with squint and yet perfectly free from any pathological condition whatever, and that will not be improved by treatment. On the other hand we will define amblyopia ex anopsia as the condition of deminished vision in which there is evidence of non-use. That the visual power will be better than $\frac{3}{100}$, which will improve with the correction of the refraction. That is always associated with squint and may or may not need an operation.

If we can accept these two conditions clinically then the intelligent treatment of all our cases of squint will be very simple. In one case we shall seek to improve the cosmetic appearance of our patient, regardless of binocular vision and in the other we must not only correct the squint but by the most careful examination and correction of the refraction aim to attain an improvement in the amblyopia with binocular vision.

T. V.

This number of the RECORD is largely devoted to reports of the proceedings of the Ophthalmological Sections of the International Medical Congress held in Moscow, Russia, and the British Medical Association which met in Montreal, Canada. We have been fortunate in obtaining rather full abstracts of the papers, with their discussions. In order that these reports should not be continued over several numbers of the RECORD, it has necessitated the crowding out of several original articles, whose authors were promised space in the October issue. They will appear in the November RECORD.

T. A. W.

THE OPHTHALMIC RECORD

A Monthly Review of the Progress of Ophthalmology.

VOL VI

CHICAGO, NOVEMBER. 1897.

No. II, NEW SERIES.

ORIGINAL ARTICLES.

THE RELATION OF THE OBJECTIVE TO THE SUBJECTIVE METHODS FOR ASCERTAINING THE OCULAR REFRACTION.

By H. V. WÜRDEMANN, M. D.,

Milwaukee, Wis.,

Ophthalmic and Aural Surgeon to the Children's Hospital; to the Milwaukee County Hospital for the Chronic Insane; Director to the Wisconsin General Hospital, etc.

ILLUSTRATED.

The object of measuring the ocular refraction is not only to give the patient better vision and to cure asthenopia, but likewise to relieve the pain and discomfort which may be in other organs as well as in the eye. But a small minority of persons who have bought spectacles from jewelers or had them adjusted by so-called opticians or alleged oculists obtain full relief, although they may be partially suited by the approximate correction which in some instances may have been given. Many people tolerate a certain amount of discomfort caused by defective visual organs while in good health or when little close work is necessary for their vocation; others do not know the need of glasses. Deterioration of general health or increase of near work may develop ocular symptoms or render them more pronounced. The ophthalmologist is frequently consulted after the patient has run the gamut of the irresponsible trio above noted.

Although the full error of refraction is not always entirely corrected, it is necessary that this be known as a basis from which to estimate the lenses to be prescribed, and over or under correction given according to the exigencies of the case. It is my purpose in the fol-

lowing to show the proper sphere of the several better known objective and subjective methods for estimation of refractive errors. It is now accepted that no examination is complete without the use of all of these methods in addition to the subjective examination, as each one has a distinct field of application and value.

In the application of the objective methods several modifying factors are to be considered :

I. Those Belonging to the Observer.

(A) Physical:—(a) The accommodation of the operator should be relaxed, his eye fixed for distance and if ametropic the amount of his own error should be corrected. Some men have never learned to relax their accommodation sufficiently to allow of accurate observation by the ophthalmoscope. (b) The line of examination (visual line of the operator) must coincide as nearly as possible with the visual line of the patient, as the well-known irregularity of the cornea and lens gives different measurements when the line of examination is eccentric to the visual axis.

(B) Psychical :—(a) The most important of these is the personal equation of the observer. This may be defined to be the power accurately recording observation and varies according to his physical and mental condition. It is well known that when tired or worried the mind will not appreciate niceties of measurement in those procedures requiring close and accurate observation. This varies according to the observer. Some persons, no matter how capable in other ways, are unable to make accurate observations. (b) The experience of the operator is likewise a factor, as it is evident that accurate work cannot be expected of a tyro.

II. Those Depending upon the Patient.

(A) Physical:—(a) His accommodation should be perfectly relaxed for skiascopic or direct examination. (b) His pupil should be moderately or fully dilated. The relaxation of the sphincter afforded by the dark room and by his distance fixation is often sufficient, but in many cases a cycloplegic or mydriatic will be required. (c) The visual line of the patient must coincide as nearly as possible with that of the examiner.

(B) Psychical:—(a) The tractability of patients varies ; some seem incapable of keeping the eye still ; the mental hebetude of others is a hindrance, although this factor is not so important as in the subjective tests.

In the following I will presume that the lighting, instruments and position of the operator and patient are proper and deal mainly with the qualifications of the several methods as regards their accuracy and convenience. However, brief allusions will be made to the instruments and methods which I prefer.

Methods.

I. *Keratometry* :—For practical purposes the use of the ophthalmometer may be limited to the determination of the amount and axis of the corneal astigmatism.* It gives no hint as to the presence of myopia or hyperopia. Mydriatics are never required and are a hindrance to proper fixation by the patient. The instrument of Javal and Schiötz is the most applicable for clinical use; that of Helmholtz is more complicated and requires too much time. The ophthalmometer is to be used with the light from one-eighth of a hemisphere of clear sky, or the best artificial illumination, preferably the electric light; and so far as possible, the eye under examination is itself to be shielded from light. There must be steadiness of the instrument with the patient and surgeon in comfortable positions. The patient should fix the center of the objective in order that the measurements may be made in the visual axis, the principal meridian of the cornea (that which passes through the corneal axis) being ignored, and the examination made along the visual axis, as the ultimate object is not the measurement of the cornea but the fitting of a useful lens. Weiland⁷ has demurred from this stand and to my mind goes to unnecessary trouble in the measurement of the angle alpha. It has been repeatedly shown that even so little as 5 degrees away from the visual axis on the corneal surface there may be a difference in curvature amounting to 1.00 or even 2.00 D.^{1 5 "}

The corneal astigmatism does not usually coincide with the total astigmatic error. In emmetropia, hyperopia and myopia without astigmatism there is usually a corneal astigmatism of .25 to 1.00 D (average .50 D.) *with* the rule which is neutralized by a corrective lenticular astigmatism which is *against* the rule. The fact that the lens is usually astigmatic is proven by those cases in which no corneal astigmatism is apparent at the visual axis and yet there is a total astigmatism of from .25 to 1.00 D. I have found that as a general rule this lenticular astigmatism averages .50 D. in adults and in children may be more, in old persons less, and that in but 20 per cent. of the cases it is the same. Thus as a general

rule the ophthalmometer may be considered to give .50 D. in excess of the astigmatism when *with* the rule and .50 D. less when *against*. Add the algebraic formula .50 D. to the astigmatism found by the ophthalmometer.⁷

Several years ago an eminent author came out with the statement that the astigmatism found by the ophthalmometer coincided with the total astigmatism and provoked quite a controversy. Refutations of his statements were numerous and it was shown that many cases of pure lenticular astigmatism occur of which the ophthalmometer gives no evidence. The axis of the corneal astigmatism in the visual line rarely differs from that of the total astigmatism. I find the variance in less than 5 per cent. of my cases. Although glasses are exceptionally prescribed (for instance, in oblique astigmatism) at a slightly different angle from that given by the ophthalmometer or from that elicited by the subjective test the change is usually one of judgment and necessary for binocular vision. I do not consider that more than one reading of the ophthalmometer is necessary, nor that it is advisable to strap the patient's head to the rest as has been advised by Lautenbach.⁴ If variance be found in several readings such depends upon inaccurate observation.

The practical value of ophthalmometry, therefore, is mainly that of a method of examination that will make an important suggestion as to the presence, degree, or direction of astigmatism, which when followed up by other methods of measurement, may effect a greater saving of time.⁸

II. *Ophthalmoscopy*.:—The determination of refraction by the *indirect method* with the ophthalmoscope is only approximate and inexact and its application inconvenient.

Examination by the *direct method* gives the total refraction. It enables us to immediately assign an approximately just share to the influence of ametropia in causing imperfect vision. The first ophthalmoscopic examination will in general give us the basis for a preliminary or approximate diagnosis of the refraction; the lens required to give the clear view of the fundus informing the observer of the hyperopia or myopia present, and the distinctness of the view that it gives indicating the presence, degree and regularity of astigmatism. All this is accomplished in perhaps a fraction of a minute.

The ability to measure by their refraction the relative position of different points seen by ophthalmoscopy, gives it an important value very imperfectly shared by skiascopy alone.

Of the ability of the ophthalmoscopic examination to reveal latent hyperopia, there must always be some doubt, for in a certain number of cases it fails to accomplish it. In this matter of rendering manifest the total hyperopia, it has not, in our own experience, shown any very pronounced superiority over the subjective method. Of the exactness of the determination made with it in my hands it will measure hyperopia or myopia to within 0.50 or recognize the presence of 0.50 D. of astigmatism and approximately the direction of its principal meridians.

The most serious hindrances, however, to constant accuracy of the ophthalmoscopic examination of ametropia are those dependent on the eye of the patient. If the patient's pupil be unduly small, the accuracy obtainable by this method is correspondingly diminished by the diminution of the circles of diffusion on the observer's retina. On the other hand, if the pupil dilate moderately, as it does in the majority of cases in a thoroughly darkened room, portions of the dioptric media will be exposed at the margin of the pupil that differ materially in their refractive power from the visual zone, and thus the refraction which may really be obtained by the refraction ophthalmoscope will differ essentially from the refraction of the visual zone which is sought." The Morton or Loring refraction ophthalmoscopes or modifications of the latter seem to be the best forms.

III. *Skiascopy*.—Skiascopy is on the whole the most accurate and reliable objective method of measuring ametropia." It measures the *total refraction* of the eye which may be modified by the accommodation or by glasses. It does not differ materially from ophthalmoscopy or the subjective test in detecting latent hyperopia; the subjective test being in intelligent patients perhaps the most accurate of the three methods. The difficulty in applying the test is greatly increased and the accuracy and certainty of its results diminished if the visual zone be very small, *i. e.* if that portion of the cornea further than 5 degrees from the visual axis be of different curvature than that of the central point. These eyes are the exception, and yet where the method is carefully used in irregular corneal curvature, in conical cornea, in partial lenticular or corneal opacity and other high grades of astigmatism, it is a full confirmatory test, as in nearly all eyes the result of careful skiascopic measurement will give the best obtainable vision. When used with the combination of lenses decided upon from the trial case it is a check upon other methods and upon itself.^{2 6 8 10 13} The same general rules as regards the visual axis of the examiner and the patient are applicable as in ophthalmoscopy and

the same personal limitations apply. Examination is usually best conducted at 1 meter from the patient, and with the plane mirror, the source of illumination being near the surgeon's own eye, the appearance observed in all eyes being reduced to those of an eye having a myopia of 1 D. If a weak minus or plus glass be put before the eye, movements with or against the mirror are elicited. In astigmatism the band of light is to be developed and its movement neutralized. The phenomena of the shadow test are presumed to be known and are fully described in numerous articles and books.

Although the application of the method may be carried out by the ordinary plane mirror, trial case and test lenses it has been found advantageous to have a small amount of apparatus, all of which is comparatively inexpensive. In order to obtain the satisfactory point

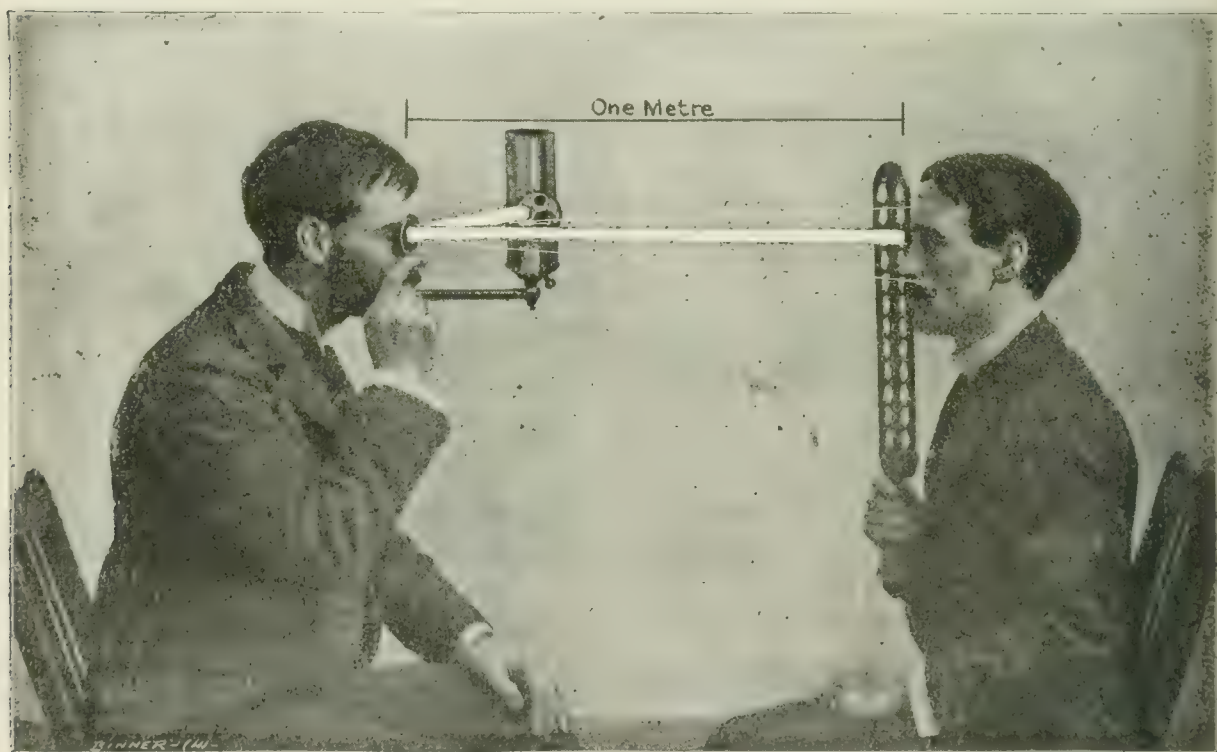


Fig. 1.—Skiascopy with the plane mirror, cover chimney and hand skiascope.

of light special cover chimneys for the Argand burner have been devised, the best of which is that of Thorington.⁶ Special plane mirrors have also been advocated by a large number of operators. Jackson² has a new mirror with sight hole made by removal of a portion of the silvering of the mirror and the backing flushed even with an additional piece of glass, having also an adjustable disk which serves the purpose of a cover and converts the reflecting surface into a

large or small mirror as desired. The axometer of Thorington and inclinometer of Prince have their special indications for determining the exact astigmatic axis.

The disadvantage of placing and replacing the lenses from the trial case has been obviated by a number of large and small instruments. The simplest of the disk forms being those of Burnett and of Würdemann¹⁰; a recent addition to the armamentarium, being a complex stationary instrument designed by Jennings.³ I have however found that the simple hand skiascope (see Fig. 2) manipulated either by the patient at the direction of the operator (see Fig. 1) or held in one hand by the operator in front of the patient answers the purpose and is more applicable, on account of its simplicity. In addition to this I keep in the dark room several pair of reversable frames containing 1.00 D. and 2.00 D., 3.00 D. and 4.00 D., 1.00 D. and 2.00 D. upon which the lenses of the hand skiascope are superimposed for the higher degrees of ametropia. In practice it is often convenient to commence the skiascopic examination over the spherical lenses which have been found by ophthalmoscopy. As each meridian is corrected at a time, the spherical glasses alone are necessary for the test, although after the subjective examination is over the correction found is usually subjected to a revision by skiascopy, when of course the combination of spherical and cylindrical lenses which may be necessary for the case are placed in the trial frames upon the patient's face. It is now considered that with an eye otherwise normal except for its refractive error and being under the influence of a reliable cycloplegic, there is no more accurate objective method of obtaining its exact correction than skiascopy.

Skiascopy has the following advantages:

The character of the refraction is quickly diagnosed.

The exact refraction is obtained without questioning the patient.

Little time is required to make the test.

No expensive apparatus is necessarily required.

Its great value should never be underestimated in nystagmus, young children, amblyopia, aphakia, illiterates and the feeble minded.

The aspirant should remember, however, that skiascopy is a difficult method to master and that although the theoretical basis is perfectly simple and the phenomena readily observed, nothing but a thorough understanding of the optical principles and long practice will render one an accurate skiascopist.

By any one of the objective methods in common use the eye may

be measured and glasses prescribed, but we should ultimately come down to that final test which is given by the patient himself after he has had the prescription filled. It were foolish to assert that any one method should be relied upon to the exclusion of others. All objective forms of examination are subservient to the test at the trial case and may be considered as essential preliminaries to the same. It is my routine practice in all cases (even simple presbyopia), to examine the patient by ophthalmoscopy, skiascopy and the ophthalmometer in order to ascertain the optical condition of the eye before proceeding to the subjective test.

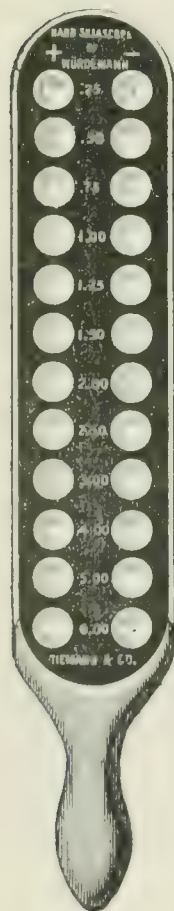


Fig. 2.
Hand Skiascope

There are some points of interest, perhaps peculiar to myself, that I deem of considerable importance. In the order of examination for refraction cases, I first ascertain the visual acuity, then use the ophthalmometer, then try the shadow movement by the concave mirror, proceeding at once (if the patient be over forty) to the direct method and skiascopy with the plane mirror, after which the subjective and the muscular tests are made. If the person be under forty years of age and not strongly myopic or if not otherwise contra-indicated, a mydriatic is used, usually the gelatin disks of homatropin and cocain of Casey A. Wood. Atropin is never needed for any of the objective tests. I find it occasionally indicated for satisfactory examination by the subjective method in accommodative spasm, and in hyperopic cases where on account of imperfect relaxation of accommodation under homatropin there is considerable discrepancy between the results as found by the objective methods and the trial case. Atropin is usually instilled for refraction of children's eyes. I prefer the hand skiascope to the more complex rotary disk. My own model of the rotary disk has been laid on the shelf for several years, while the hand skiascope (see Fig. 2) is used several times daily.

In moderate or high myopia or hyperopia I often find it useful to put the sphericals as found by the refraction ophthalmoscope on the patient and then to make the finer measurements by superimposing the skiascope, adding thereto the strength of its lens in booking the value

of the meridional refraction. From the findings of these objective methods one may proceed at once to place the chosen lenses before the patient's eye. Thus the subjective test may be practically reduced to the trying of one or two higher or lower combinations and to the determination of heterophoria. The lenses thus found are then proven by brief skiascopic and direct examination in the dark room.

The objective methods of measuring ametropia are as follows :

1. By effecting a saving of time ; and by this, and as confirmatory tests, securing accuracy.
2. They are applicable to cases and to uses for which the subjective method is entirely inapplicable and useless.

Thus the objective methods can be applied to determine refraction in the eyes of small children, in the mentally defective and in the lower animals. Also in the eyes of malingerers, conscripts, applicants for pensions, insurance, or society benefits, plaintiffs claiming damages for injury, or in general wherever the coöperation necessary for the subjective test is lacking, because of lack of intelligence, perversity or self-interest.

It should be borne in mind that all the methods of testing the eyes are but a means to an end and that no one method should be relied upon to the exclusion of others.

The array of modifying factors here brought forward regarding the objective methods are as nothing to that great obstacle encountered in all subjective examinations. This is the fact that we are here dealing with a person unskilled in observing niceties of difference and shades of value, whose statements are not to be depended upon, and where all the points as to personal equation apply with much greater force. How often it is that we find after many tests by the trial case that the patient will accept equally well a number of combinations ; for instance $+ .50 \subset + 1.50, 90^\circ$, or $+ .75 \supset + 1.00, 90^\circ$, or $+ 1.25 \supset + .75, 90^\circ$. If we have made the objective tests we know within .25 or .50 D. what we had best take and place that combination immediately before him ; with but few changes (usually only in the sphericals) the examination is completed. Thus by the preliminary use of the objective tests we eliminate in a great measure dependence upon the faltering judgment of the untrained patient and substitute therefor the skill of the expert. Many a weary hour of anxious application at the trial case is saved me and my associates by the objective methods ; better work is done and patients are refracted in one fourth the time necessary for conscientious work by the trial case alone

There is no royal road to the acquirement of dexterity in the use of the objective tests ; while easy to the expert, considerable practice is necessary before accurate work may be depended upon. As inactive minds and slow fingers are apt to be too conservative, thus it is that many have been too lazy to take upon themselves the needful training to properly apply the objective tests. It is a painful fact that many otherwise good ophthalmic surgeons depend entirely upon the trial case and do refraction work which in point of accuracy is but on a par with that of the average jeweler or "optician" who sells glasses.

REFERENCES.

1. Burnett: "Further Contribution to Keratometry," *OPHTHALMIC RECORD*, December, 1891.
2. Jackson: "Skiascopy," 1895.
3. Jennings: "Improved Skiascope," *Annals of Ophthalmology*, Jan., 1897.
4. Lautenbach: "A Few Thoughts about Ophthalmometry, etc.," *OPHTHALMIC RECORD*, December, 1893.
5. Sulzer: "La forme de la corneè humaine et son influence sur la vision," II., *Archives d' Ophtalmologie*, Jan., 1892.
6. Thorington: "Retinoscopy," 1897.
7. Weiland: "A Critical Study of the Main Defects of Javal's Ophthalmometer," *Med. News*, June 4th, 1892.
8. Jackson, Burnett, Würdemann and Thompson: "Report on the Value of the Objective Tests for Determination of Ametropia" Special Committee Ophthalmic Section A. M. A., *Journal A. M. A.*, September 1, 1894.
9. Würdemann: "What may be considered Normal Corneal Astigmatism?" *Journal A. M. A.*, Aug. 27, 1892.
10. Würdemann: "The Use of Skiascopy," *American Journal of Ophthalmology*, May, 1890.
11. Würdemann: "A Simple Skiascope," *American Journal of Ophthalmology*, July, 1891.
12. Würdemann: "The Status of Skiascopy," *Journal A. M. A.*, Sept. 1, 1894.
13. Würdemann: "Skiascopy (the Shadow Test) in the Determination of the Ocular Refraction," *International Clinics*, Vol. I., 6th series.

COMPLETE BLINDNESS DUE TO ACUTE POISONING
FROM OVER USE OF ESSENCE OF JAMAICA GIN-
GER, RECOVERY FOLLOWED BY TOXIC
AMBLYOPIA OF THE ORDINARY
CHRONIC FORM WITH EV-
ENTUAL ATROPHY.

By ARCHIBALD G. THOMSON, M. D.

Ophthalmic Surgeon to Children's Hospital, Assistant Ophthalmic Surgeon to Wills Eye Hos-
pital and Orthopaedic Hospital and Infirmary for nervous diseases.

Philadelphia.

ILLUSTRATED

As this case presents several very interesting points as regards the fields and uncommon nature of the drug producing the poisoning, (which is the first case of this condition due to Jamaica Ginger reported) and as it has passed through both an acute and chronic form, I think it may help to throw some light or help to confirm some of our theories on this very interesting condition of toxic amblyopias.

The history of the case is briefly this:

J. R. age 32, sailor, mother and father both dead, does not know cause of death father supposed to have died from phthisis. Had diseases of childhood but never any serious disease, denies absolutely any specific or venereal trouble. Never has been a steady drinker. From his occupation as a sailor would go several months without drinking any alcohol, but would at times on reaching shore go on a spree for a couple of days, this he states to have occurred two or three times a year. He has been moderate in the use of tobacco, smoking a pipe and about a five cent package of tobacco a week. Eye sight always been good until Dec. 22, '96, when he came ashore from a cruise and with a party of friends, being unable to procure whisky, became intoxicated on essence of Jamaica Ginger, the ordinary commercial kind sold in country stores. This was taken as whisky is with water. He remained intoxicated for two days, estimating in that time to have taken about a quart and a half of the Jamaica Ginger. The first day after he stopped he describes his feelings as being those similar to a bad alcohol debauch, headache, nausea, sick stomach, etc. On the evening of the next day, the fourth day from the first taking of the drug, while lighting the lamp in the cabin of the vessel, he noticed that everything appeared hazy and that his vision was failing, also some slight photophobia. By the next morning he could not see a lighted match held directly before him, but had peripheral vision sufficient for him to grope his way around that day. The next morning (fifth day) however his light perception had entirely disappeared both central and peripheral, and he was completely blind. This condition lasted seven days when the vision gradually began to return, first from the periphery of the field until finally he was able to read very large print with great difficulty (headings, etc.) The time required from complete blindness to this condition of recovery of his vision he estimates to be about four weeks. He remained in this condition about three weeks when he noticed his vision again be-

ginning to fail, this time very slowly until the present condition appears which is three months and a half from the first taking of the drug and he has not had any treatment.

The anterior aspect of the eyes are apparently normal (cornea and conjunctiva) pupils slightly dilated, but react normally both to light and accommodation. V. R. = Fingers at 1 meter. V. L. = $\frac{1}{100}$ excentric. Ophthalmoscopic examination. Media clear. The disc very pale few capillary vessels present. The portion of the disc occupied by the papillo-macular bundle of fibres, being the lower and outer quadrant of the disc, is completely atrophied, being greenish white color. Fundus otherwise normal. There is a well marked physiological cup and no lymph on the vessels showing the atrophy to be primary and not secondary to a previous papillitis. There is no evidence of any cerebral or spinal trouble, (locomotor ataxia, disseminated sclerosis or hysteria.)

I may state here that he describes one of his friends, that accompanied him on this spree, to have had his vision similarly affected but not to such a degree; he however, was treated and recovered. In questioning him more closely some three months after I first saw him he stated that since his vision had been affected he had heard of several other cases in which Jamaica Ginger was the cause of defective vision and that its use as an intoxicant is very common in places where alcohol in forms of whisky could not be obtained.

The case presents several interesting points.

- I. The uncommon nature of the drug producing the loss of vision.
- II. The suddenness of the attack of complete blindness.
- III. The interesting point presented by the fields, which shows us most probably the pathological condition that takes place in the nerve in these cases.

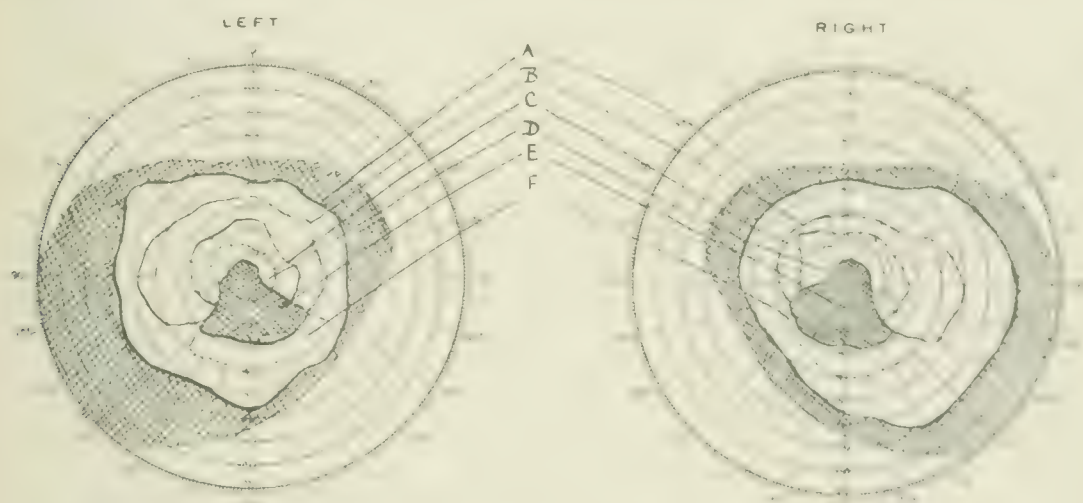
There is a question of difference between some writers on this subject as to whether alcohol which is adulterated with certain substances is more or less liable to produce toxic amblyopia than the pure spirits? But it is generally conceded by all, I think, that the cheapest and worst kind of alcohol is more liable to produce this condition. I have been unable to procure a specimen of the Jamaica Ginger taken by the patient, he however describes it as the ordinary commercial kind, but publish the following letter from Prof. Remington of the Philadelphia College of Pharmacy to whom I wrote to ascertain the ingredients contained:

"What is known as Jamaica Ginger or more properly Essence of Jamaica Ginger made in a very simple manner by percolating the ground ginger root with alcohol, or alcohol containing water. The cheap trash found in country stores is often made with a portion of capsicum, in this way saving expense. You can see that a very little

capsicum would take the place in pungency of a large quantity of ginger. Of course sufficient ginger would have to be used to give a flavor to the decoction. Then again if it is made hot with cayenne pepper, a weaker alcohol can be used, and this would cheapen the product very much. *Trusting I have been of service, etc. Joseph Remington.*"

From the suddenness of this attack of blindness, the perferred character of the condition following and history of a friend and several other cases being affected in the same way, I think it shows undoubtedly that the presence of foreign substances in the spirits is more liable to produce toxic conditions.

The fields are the most interesting part of the case as they show probably the pathological process that has and is taking place in the nerve.



DESCRIPTION OF FIELDS.

A. Form Field. B. Blue Field. C. Red Field. D. Area Relation Scotoma for Color. E. Posterior Scotoma Complete blindness. C. Red Field. J. White seen dimly. Relative scotoma if color fields large enough.

The charts represent the last fields taken which is some six months from the time of first taking the drug; the character has not materially changed with the exception of a slight contraction in the form field, so I only show the most recent ones. The contraction of the form and color fields (which were taken in a good light) I take to be due to the general atrophy of the nerve. As I unfortunately did not see this case until some three months after the drug was administered, I cannot show the fields immediately following the acute blindness. But from the picture shown by the fields today I surmise, that on recovery from acute blindness, there was a central scotoma of the ordinary form,

occupying the area from the fixation spot to blind spot. This as shown by the chart has gradually enlarged until it has broken through the color fields. The area represented by letter F. shows that although white is seen, it is only dimly, in relative comparison to other portions of the field and this area would show a scotoma for colors if the red and blue fields were large enough; this clearly indicates that this portion of the nerve although not atrophied is decidedly affected and if the case terminates badly, as it probably will, the positive scotoma will finally break its way out to meet the periphery of the field.

As there has never been a post-mortem examination reported in an acute case of this character and as there is a primary atrophy of the nerve I take it that the following change has taken place in the nerve:

First, from the profound poisoning the patient was subjected to, we have an acute interstitial retrobulbar neuritis or effusion into the sheath of the nerve, affecting as alcohol always does, the papillo-macular bundle of fibres, and producing at first most probably a central scotoma negative in character (for color not form) this causing the blurring of vision on the first day.

As the interstitial neuritis or effusion into the sheath of the nerve increased, the pressure on the axis cylinders became greater, the scotoma gradually changed from negative to positive in character and finally becoming larger and larger until it spread over the entire field causing complete blindness. After the seven days of complete blindness as the neuritis or effusion subsided and the pressure relieved, the vision gradually returned with the exception of the papillo-macular bundle which owing to its depth in the nerve was more seriously affected by the pressure. Now as the vision again began to fail after three weeks of comparative recovery, I think this to be due to a consecutive atrophy following the pressure which was exerted upon the axis cylinders by the neuritis which appears to be clearly demonstrated by the interesting fields, showing the breaking through of the scotoma, which indicates that the atrophy is not only confined to the papillo-macular bundle but has extended to the adjacent fibres; and will eventually reach the limit of the field. The case has been under my observation for the past three months and received all the forms of treatment for toxic cases, the change has been slight but if any for the worse.

A CASE OF TRAUMATIC BLINDNESS, WITH PARTIAL RECOVERY OF VISION AFTER FIFTEEN MONTHS.

By W. MERLE D'AUBIGNE CARHART, M. D.

Assistant Attending Surgeon Manhattan Eye and Ear Hospital, Instructor in Diseases of the Eye and Ear in the New York Post-Graduate Medical School.

New York

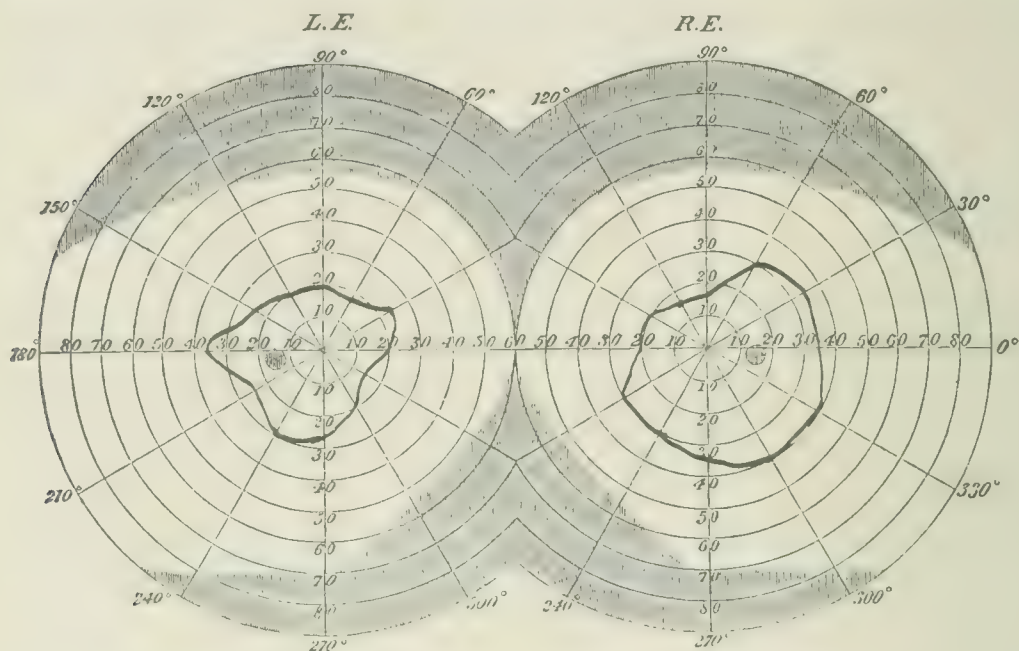
ILLUSTRATED.

On August 8, 1890, J. S., aged 30, in coming out of a low doorway, struck his head with considerable force against the top of the doorway. At the time he was with a driving party, and during the return to his hotel the jar of the wagon caused him intense pain. Before the hotel was reached he was somewhat delirious, and was supported in the wagon by his friends.

An examination of the injury showed an abrasion over the vertex, a little to the right of the median line, with slight swelling of the surrounding tissue. During the following night the physician in charge succeeded in restoring him to partial consciousness, but within a few hours stupor, alternating with delirium, set in, lasting five days. The hotel was situated near the railroad track, and the passage of the trains caused violent convulsions, beginning when the train was in the distance, and increasing in severity as it passed. So sensitive was his brain to the irritation of sound vibration, that each convulsion began before his attendants could hear the sound of the approaching train. Having continued violent about three weeks, the convulsions diminished in intensity and frequency, and finally ceased about October 7th. Within five days after the accident he recovered consciousness and his mind, in the intervals between convulsions, was comparatively clear, except that memory of the distant past seemed defective, and the effort to think was painful.

One week from the accident, after a convulsion, he noticed objects in the room were indistinct, and each day thereafter his vision decreased. Within one week more for an hour after each convulsion, his vision would leave him, recovering partially in the intervals. On August 22d, an especially severe and prolonged convulsion was caused by the passage of two trains in quick succession, and all that evening vision remained very indistinct. The next morning he had merely perception of light, and within two days total blindness set in, which lasted fifteen months. In September he was examined, with a view to operative interference, but doubt as to the locality of the lesion decided against the operation. It was found that the left arm and leg were partially paralyzed, sensation being also impaired and the reflexes abolished on the same side. By the 15th of October he had sufficiently recovered from the weakness and prostration following the traumatic meningitis, to be removed from the hotel in the Catskills to his home in Orange, New Jersey. There his general health continued to improve, and the impairment of motion and sensation passed off gradually, until he was able, within a few months, to do anything that was possible without vision. Once, during the next year, an attack of stupor and convulsions occurred, of two hours duration, brought

on possibly by business anxiety and worry. On November 5, 1891, he noticed a



faint light, and within a week objects were visible. In December he could see comparatively well with the left eye. The right eye remained blind till the following spring, when it partially recovered sight, but not to the extent of the other eye. On November 12, 1892, he became unconscious for an hour, after which his sight was dim for an hour and a half longer, but since that time he has had no trouble of the kind to my knowledge.

He was seen by me in July, 1893, when his vision was R. E. $\frac{1}{2}$, L. E. $\frac{2}{3}$, unimproved by lenses. The ophthalmoscope showed nothing distinctly abnormal in either eye. There was no disturbance of the ocular muscles at that time. Unfortunately, I failed to secure a satisfactory test of the field of vision, and I understand no tests, either of the field of vision or of the ocular muscles, were made within a short time of the accident or during his period of blindness. When I saw him, nearly three years had elapsed since the accident, and in that time some oculo-motor paralysis might have disappeared, or even degenerative changes in the retina made the field of vision less conclusive than if taken at an earlier date.

I have given this clinical history in detail because it seems to me to throw some light upon cerebral localization. The history shows hemiplegia, hemianæsthesia, and abolition of the reflexes, all of the left side, with total blindness, the latter apparently being developed in the course of a traumatic meningitis. I think it probable that there was bilateral homonymous hemianopsia, due directly to the traumatism, and although no charts of the field of vision taken shortly after the accident are at hand for demonstration, the little information of the present field of vision in my possession tends to show it to be markedly defective in both eyes. The pressure upon both cunei of a men-

ingeal exudate may well have caused the defective sight of an hemianopsia to become total blindness. The partial recovery of vision is in my estimation to be explained by the gradual absorption of the exudate, while the visual portion of the primary lesion has unfortunately been more permanent. The location of this primary lesion has been a matter of grave doubt, and all I can do is to suggest that it possibly was situated in the visual tract, near the right internal capsule. This is the only situation where hemiplegia and hemianæsthesia of the opposite side are combined with bilateral homonymous hemianopsia, the left internal capsule being out of the question from the crossed paralysis of motion and sensation referred to the left side. A lesion within the occipital lobe, or in the cortex, would not be accompanied by either hemiplegia or hemianæsthesia. A lesion in the optic thalamus might have hemianæsthesia with hemianopsia, but not hemiplegia also. If the optic tract were affected near the crus cerebri, we might get hemiplegia and hemianopsia of the one side and oculo-motor paralysis of the other; but in our case we have hemianæsthesia and hemiplegia of the opposite side and no evidence of oculo-motor paralysis. Any lesion nearer the orbit in the optic chiasm would give unilateral or bilateral hemianopsia, but of course no hemiplegia or hemianæsthesia. The hemiplegia and hemianæsthesia apparently were pressure complications of a lesion confined to the visual tract, since they passed off within a few months, leaving as the permanent result merely the visual defect; and for that reason I do not consider a cortical location in the motor area for the primary lesion at all probable, for motor disturbance caused by traumatism is not usually transitory unless relieved by operation. If I am right in my location of the primary lesion, it was beyond the reach of direct operative interference; but if I am also right in my idea of the damage done to the visual centres by the inflammatory exudate, an attempt to relieve pressure and drain seems to me to belong to the surgery of the future if not of the present. There is very little shock or danger in a small trephine hole, which ought to heal with healthy granulation tissue within a week under proper aseptic conditions. I have had depressed fracture cases up and about in two or three days and the hole filled in under the first dressing, as undoubtedly have most of my professional brethren with surgical experience. I do not say I would have done as follows if I had seen the case at the time, but it seems to me that an immediate exploration of the motor area near the site of the external wound would have been good surgery to settle all doubt as to the state of affairs beneath

TRAUMATIC BLINDNESS.

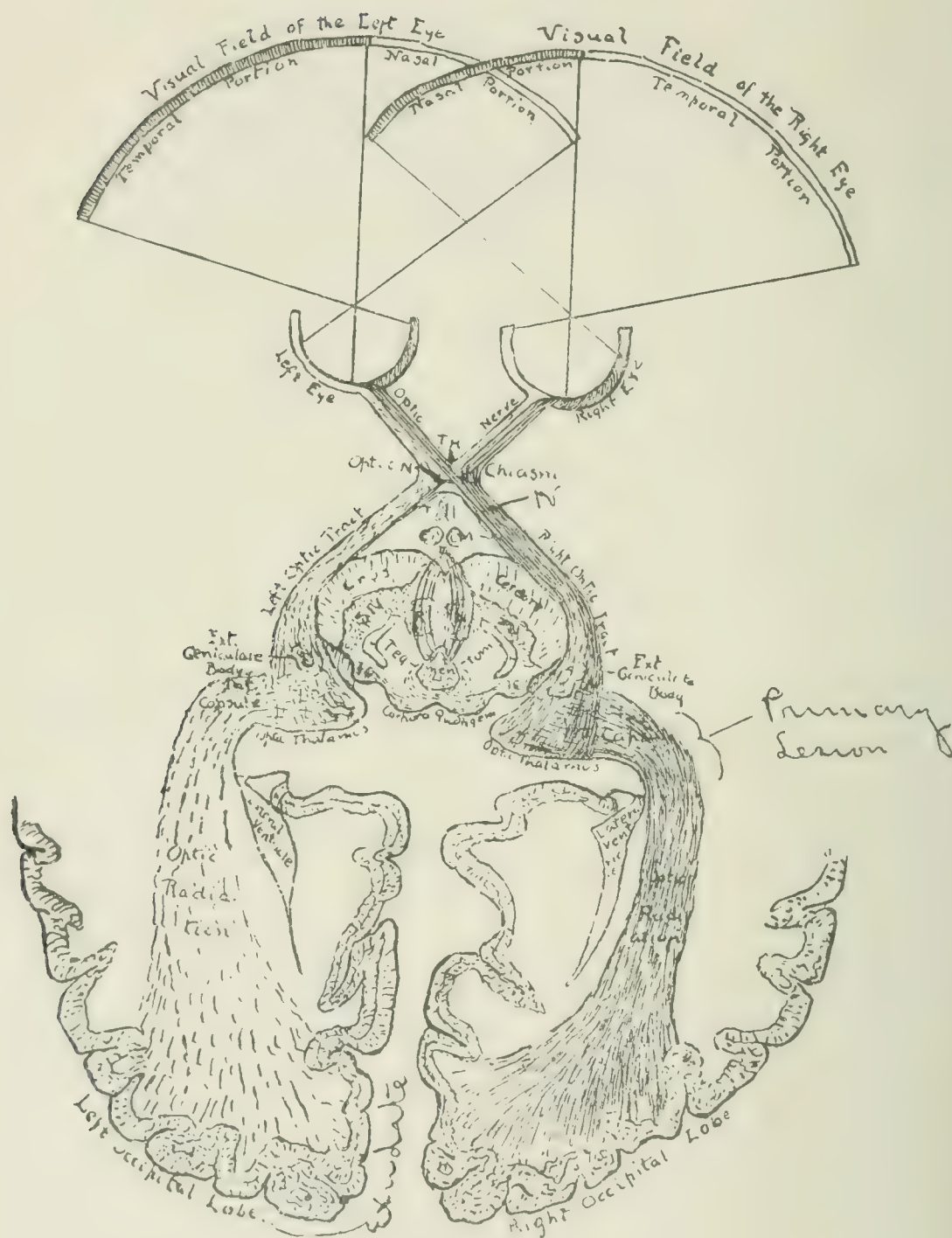


CHART OF OPTIC AND VISUAL TRACTS.

- T. Unilateral hemianopsia.
- II. Bilateral heteronymous hemianopsia.
- N. Bilateral homonymous hemianopsia.

the skull cap. Perhaps nothing more than slight depression of some

spicule of bone might be found. If so, might not one possible cause of the meningitis be removed, and so the patient spared those disastrous convulsions? Secondly, I believe some day we shall make trephine openings in the post-auricular region for drainage of occipital pressure from hemorrhage or exudate, as in this case I have reported.

Since writing the above I have had an opportunity to make another examination of the eyes of J. S., with interesting results. His vision to day is: R. E. $\frac{3}{80}$, L. E. $\frac{3}{80}$, and by the ophthalmoscope the macula and optic disc seem entirely normal in both eyes. I give the field of vision, which is apparently more contracted in the left than in the right eye. He is in fairly good health, and with the exception of some headaches he does not find much trouble on using his eyes. His central vision is sharp and distinct for near and distant tests. There never have been any symptoms of alexia or aphasia.

THE AETIOLOGY OF DACRYOCYSTITIS

By J. W. H. EYRE, M. D., B. S.

LONDON, ENG.

Senior Ophthalmic Assistant to Guy's Hospital
(From the Bacteriological Laboratory, Guy's Hospital.)

The following notes upon some of the factors in the causation of lachrymal suppuration are offered as a contribution to our knowledge of the bacteriology of this important subject.

Putting on one side those cases which can be definitely traced to an extension of the pyogenic processes from carious or necrosed bone in the immediate neighbourhood of the sac, and confining our attention to such as have their inception in the mucous membrane lining the interior of the sac, we recognise clinically three forms, viz:

- (1) Mucocoele.
- (2) Acute Dacryocystitis.
- (3) Chronic Dacryocystitis.

Whilst often merging the one into the other, the clinical picture of a typical case is sufficiently characteristic in each of the three groups; and it may not be out of place to briefly indicate their chief features.

Mucocoele. This condition often gives rise to no discomfort, or at most the patient complains of watering of the eye or running over of the tears. On examination the lachrymal sac is found to be filled and distended with a clear or somewhat opalescent, viscid or gelatinous

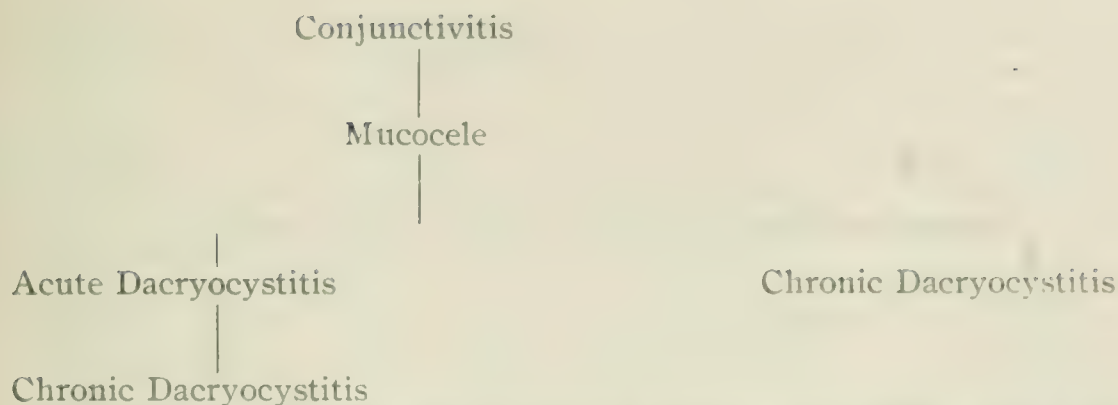
mucus, the distension giving rise to a small spherical swelling under the skin at the inner canthus, which imparts an elastic sensation to the finger. Firm pressure over the tumor results in the forcing of the contained mucus through the nasal duct, or its regurgitation through the canaliculi. Conjunctivitis is absent, although a previous history of "inflammation of the eye" of a muco-purulent type can generally be obtained.

Acute Purulent Dacryocystitis. Occurs as a rule in a sac already occupied by a mucocele. In this connection Nettleship remarks "A mucocele is always very apt to inflame and suppurate, the result being a lachrymal abscess. Most cases of lachrymal abscess indeed have been preceded by mucocele."

The formation of pus is usually ushered in by well marked constitutional symptoms, a rise of temperature of two or three degrees, sometimes accompanied by rigors, constipation, furred tongue, etc. Locally there is more or less extensive oedema of the root of the nose, eyelids, and upper part of the cheek, the skin surface being of a dusky red color. The tissues over the sac are brawny and infiltrated and the general appearance is suggestive of facial erysipelas. Pain is present in the vicinity of the sac, and is increased on pressure. In some few cases resolution takes place but the majority go on to suppuration. In the latter case the skin over the lower part of the sac may become thinned and give way allowing the pus to escape, and later this outlet occasionally causes a troublesome fistula. Marked conjunctival injection, together with a profuse serous discharge is almost invariably associated with this condition.

Sub-acute or Chronic Dacryocystitis. A commoner form of sac trouble than the acute. It not only occurs as a sequela of acute purulent dacryocystitis but frequently follows directly upon a mucocele, without the intervention of the acute stage. The chief symptom is epiphora; there is often no visible distension of the sac, and certainly no pain, but occasionally slight tenderness on pressure over the sac, a proceeding which results in the escape of a thin purulent or muco-purulent fluid from the canaliculi. A chronic conjunctivitis is an almost invariable concomitant.

The sequence of events is, firstly, some form of conjunctivitis on the subsidence of which a mucocele is noticed; upon this follows either a chronic dacryocystitis, or an acute dacryocystitis which in turn gives place to the chronic form, and may be graphically thus:



Turning now to the bacteriological aspect of the disease Morax has recorded the fairly constant presence of a slender bacillus in the gelatinous material contained in the sac in cases of mucocele. This bacillus, which was decolorised by Gram's method, was cultivated with difficulty and was evidently considered by the author as identical with the bacillus described by Weeks as the cause of acute muco-purulent conjunctivitis. Mazet mentions the presence of staphylococci and other organisms in subacute lachrymal inflammation.

Parinaud and Morax have described one form of acute conjunctivitis from which the *streptococcus pyogenes* has been isolated, and which is usually accompanied by an acute purulent inflammation of the lachrymal sac, and from the latter situation the same organism has been obtained. The opinion is expressed by these authors that the streptococcus may be considered as specific in such cases. Widmark has confirmed these observations, and more recently Mazet has found the same organism in what he terms "empyema of the sac," often however associated with another pyogenic organism viz. *bacillus coli communis*.

A summary of my observations on a series 26 "sac" cases is arranged in the accompanying table, but before discussing them a few words upon the technique adopted in collecting the pus, mucus, etc. are necessary.

Method. The edges of the lids are first cleansed as thoroughly as possible by means of a piece of sterile cotton-wool saturated with 1 in 2000 solution of hydrarg. perchlor. The conjunctival sac is next flushed out with sterile "normal saline solution," gentle pressure is made over the sac and the first few drops of pus expressed through the puncta are washed away by the stream of solution. The pressure over the sac is continued and the pus now exuding is removed on a sterile cotton-wool swab and planted on to slanted glycerine blood serum and also on to agar-agar. It might appear at first sight much

more simple to plant the material in neutral or faintly alkaline nutrient bouillon, but it has been my experience that if the streptococcus is present in pus etc. in association with other organisms such as staphylococci or sarcinae, these latter are liable to so out-number the streptococcus as to render its isolation a task of no mean proportion, and the difficulty is largely increased if bouillon is the medium used.

Material. The cases were derived chiefly from the ophthalmic out-patient department of Guy's Hospital; and those included in groups I and II are placed in the order in which they presented themselves for treatment. On the other hand a certain amount of discrimination was exercised in the selection of cases falling into group III, no case being included in which the condition had been in existence for a period longer than three months: for it was found that when suppuration had continued for long periods that it was difficult and indeed sometimes impossible to demonstrate the presence of the streptococcus—the commoner pyogenic organisms, the staphylococcus aureus and albus, having taken its place.

TABLE I MUOCOCELE.

Case	Initials	Sex	Age	Eye Affected	Duration of Disease	Organisms Isolated
1	A. H.	Male	5	{ R E L E }	4 months	Staphylococcus albus—Weeks bacillus
2	E. B.	Male	38	{ R E L E }	5 months	Staphylococcus albus—Bacillus coli communis
					6 months	Staphylococcus albus & aureus—Weeks bacillus
3	Q. D.	Female	12	R E	3 months	Diplococcus epidermidis albus—Streptococcus brevis
4	K. H.	Female	28	{ R E L E }	10 years	Staphylococcus albus—Xerosis bacillus
5	E. C.	Female	66	R E	2 months	Proteus Vulgaris.
6	C. A.	Male	15	L E	8 months	Staphylococcus aureus—Bacillus coli communis
						Bacillus of Weeks—Bacillus megat

TABLE II ACUTE PURULENT DACRYOCYSTITIS

Case	Initials	Sex	Age	Eye Affected	Duration of Disease	Organisms Isolated
7	E. V.	Male	34	R E	3 days	Streptococcus pyogenes
8	L. C.	Female	23	{ R E L E }	6 days	Streptococcus pyogenes—Staphylococcus albus
					2 days	Streptococcus pyogenes
9	G. P.	Female	13	L E	6 days	Streptococcus pyogenes
10	F. H.	Female	18	L E	4 days	Streptococcus pyogenes
11	J. M.	Male	8	R E	5 days	Streptococcus pyogenes
12	H. H.	Male	23	L E	2 days	Streptococcus pyogenes
13	I. W.	Male	17	R E	8 days	Streptococcus pyogenes—Sarcina lutea
14	C. M.	Male	30	L E	3 days	Streptococcus pyogenes
15	H. W.	Female		R E	3 days	Streptococcus pyogenes—Diplococcus epidermidis albus
16	L. H.	Female	59	{ R E L E }	7 days	Streptococcus pyogenes—Staphylococcus albus

TABLE III CHRONIC DACRYOCYSTITIS

Case	Initials	Sex	Age	Eye Affected	Duration of Disease	Organisms Isolated
17	M. B.	Male	24	R. E.	3 months	Streptococcus pyogenes—Staphylococcus aureus
18	F. M.	Female	46	R. E.	10 days	Streptococcus pyogenes
19	M. L.	Female	36	L. E.	3 days	Streptococcus pyogenes
20	M. L.	Female	36	R. E.	21 days	Diplococcus Pneumoniae (of Frank)
21	H. B.	Female	30	R. E.	13 days	Streptococcus pyogenes
22	G. A.	Male	21	L. E.	6 weeks	Streptococcus pyogenes
23	H. P.	Female	12	R. E.	3 weeks	Staphylococcus aureus
24	R. E. H.	Female	47	R. E.	14 days	Staphylococcus aureus—Bacillus Xerosis
25	D. G.	Male	30	L. E.	7 days	Streptococcus pyogenes
26	F. M.	Female	9	R. E.	15 days	Streptococcus pyogenes
26	S. S.	Female	44	L. E.	2 months	Streptococcus pyogenes
						Staphylococcus aureus and albus

Taking the cases in the order of their clinical groups, it will be seen that in Table I. under the heading of Mucocoele, no one organism has been found with any sufficient degree of constancy to warrant our attaching great importance to its presence in the viscid mucus. I have occasionally found in this situation a bacillus which in the first instance grows but sparingly upon such media as glycerine blood serum or serum agar, and is not stained by Gram's method. This I believe to be identical with Weeks bacillus of acute contagious conjunctivitis, but I am unable to confirm the statement of Morax that this bacillus is *constantly* present in such cases. The staphylococcus pyogenes aureus and albus together with the diplococcus epidermidis albus are frequently met with, so too is the bacillus xerosis—a common saprophyte of the inflamed conjunctival sac. The presence of a proteus has been noted; and once I have met with a streptococcus, and apropos of this organism a slight digression is necessary. Lingelsheim pointed out that there were at any rate two distinct varieties of the streptococcus the one possessing marked pathogenic properties and growing in artificial media in long convoluted chains—the streptococcus longus, the other, non-pathogenic, and occurring as short chains, which he named the streptococcus brevis. More recently Washbourn and Goadby have confirmed these observations and have carefully worked out the biological and morphological differences between these two varieties—differences which may be conveniently summarised in parallel columns thus

Streptococcus longus.*

Streptococcus brevis

1. Pathogenic when tested upon rabbits and mice (vide foot note.) Non-pathogenic when tested upon rabbits and mice

*The streptococcus pyogenes longus and the streptococcus erysipellatus, whilst identical in their cultural characteristics are said to differ in their relative pathogenicity for mice, still for practical purposes they may be grouped together under the one heading.

- | | |
|--|---|
| 2. Grows in small flocculent masses in nutrient broth. | Grows as a uniform turbidity in nutrient broth. |
| 3. Cocci large, chains long and convoluted when grown in broth. | Cocci small, chains short, when grown in broth. |
| 4. Produces a slight amount of acid in the course of its growth. | Produces a considerable amount of acid in the course of its growth. |
| 5. Does not clot milk when grown in this medium. | Clots milk. |

The streptococcus isolated from the mucocele (case 4) undoubtedly belonged to the latter group, and was in point of fact identical with the streptococcus brevis which is now recognised as a common saprophyte of the buccal sulcus of the human mouth. Its want of virulence is shown by the following experiments.

Expt. 1. One loopful (0.5 mg.) of a 24 hour agar cultivation was emulsified with 0.5 cc. of sterile broth, and the mixture inoculated into the subcutaneous tissue of a mouse weighing 15 grammes. *Result.* No effect.

Expt. 2. 0.5 cc. of a 24 hour broth cultivation was injected into the posterior vein of the ear of a rabbit of 2000 grammes weight. *Result.* No effect.

It is worthy of note that of these six cases of mucocele four give a very definite history of a muco-purulent conjunctivitis of the affected eye, occurring within the preceding 6 months, and soon after the subsidence of the attack the lump was noticed. In the remaining cases, the condition followed an acute conjunctivitis accompanying an attack of measles in one patient: in the other the mucocele had existed since the "inflammation of the eyes" which complicated variola 10 years previously.

When however we come to consider Table II. (acute purulent dacryo-cystitis) the bacteriological results are somewhat different and certainly more definite. The streptococcus pyogenes longus is practically always present, and may be demonstrated in smear preparations made either from the pus, or, if the case presents itself at an earlier period when the oedema and infiltration are the prominent signs, the serum and blood from the affected area. Moreover the organism in question is invariably found in the serous exudation which is the marked feature of the accompanying conjunctivitis. This is an important point and one to which I shall again refer. The streptococcus longus usually occurs in the pus in a state of purity; occasionally however cul-

tivations show associated with it some few colonies of the xerosis bacillus, the diplococcus epidermidis, a sarcina, or some equally common inhabitant of the conjunctival sac.

The virulence of the streptococcus isolated from some of the cases was tested by inoculating mice with small quantities of a 24 hour old cultivation in nutrient broth, with the results shown in the following table:

INOCULATION EXPERIMENTS.

No. of expt.	Animals	Weight in grammes	Source of streptococcus	Dose of culture	Method of inoculation	Result
3	Mouse	20	Case 11	0.5 c.c.	Subcutaneously	Death in 4 days from streptococ- cic infection.
4	Mouse	19	" 11 "	0.5 c.c.	"	Death in 4 days from streptococ- cic infection.
5	Mouse	20	" 13 "	0.5 c.c.	"	No effect.
6	Mouse	18	" 15 "	0.5 c.c.	"	No effect.
7	Rabbit	1760	" 15 "	0.5 c.c.	Intravenously	No effect.

The oft repeated observation that streptococci isolated from apparently precisely similar lesions in the human subject, possesses varying degrees of virulence when tested upon mice etc., is well shown in the above table.

Case 8 possesses an interest of its own in that the streptococcic conjunctivitis, which preceded the lachrymal trouble by some three days, was most probably contracted by the patient from the infant she was suckling—the baby being the subject of a membranous conjunctivitis from which the streptococcus longus was isolated, associated only with the xerosis bacillus.*

Cases 7, 10, 13 and 15 presented themselves during the first stage of the disease, when oedema and redness were the prominent features and before any considerable quantity of pus was present in the sac. In each of these cases slitting of the lower canaliculus was practised and in three of them (viz. 7, 10, 13) the fairly common sequel of this proceeding was observed, for after an interval of 2, 3 and 4 days respectively a severe and extensive cellulitis of a diffuse type made its appearance on the affected side of the face, spreading from the inner angle of the orbit upwards to the upper eyelid and on the forehead, outwards as far as the ear, and downwards to the angle of the jaw. This was accompanied by a rise of temperature (maximum varying from 101.5°

*In this case inoculation experiments were performed, as well as a few sections of cultures upon various media, in order that the identity of the isolates from the infant and the adult be beyond doubt, as in microscopical preparations it is next to impossible to differentiate them from *Diphtheria*.

F. to 102° F.) furred tongue, headache, and enlargement of the pre-auricular, sub-maxillary, and cervical glands. In case 15, recovery was uninterrupted.

In table III, it will be seen that the streptococcus longus was present in the muco-purulent discharge with a regularity deserving of more than passing notice, for out of 12 cases this organism was isolated from the muco-pus eight times. The diplococcus pneumoniae was found in one of the remaining four.*

The virulence of the streptococcus isolated from the cases in the third table was only tested once with the following result.

Expt. 8. 1 cc. of a 24 hour old broth cultivation from case 18 was inoculated into the subcutaneous tissue of a mouse of 20 grammes weight. *Result.* Death in four days from streptococcic infection.

The pneumococcus isolated from case 19 was tested in like manner and found to possess a certain amount of virulence.

Expt. 9. About 0.5 mg. of a 24 hour old "blood agar" culture was emulsified with 0.5 c.c. of sterile broth and injected subcutaneously into a mouse of 20 grammes. *Result.* Death in 5 days from pneumococcic septicæmia.

From these investigations it would therefore appear that the streptococcus pyogenes longus is almost invariably present in cases of acute and chronic inflammation of the lachrymal sac, usually in the former and often in the latter, in pure culture; and from our knowledge of the behaviour of this organism when it has obtained a footing in other mucous membranes we may fairly conclude that it holds a causal and merely a casual relationship to these processes.

With regard to the association of stricture of the nasal duct and blenorrhoea of the lachrymal sac, it is definitely stated or as clearly insinuated by practically all writers upon the subject, that acute and chronic inflammations of the sac are caused by stricture of the nasal duct, and the theory as to the causation of dacryocystitis which has been built up around this assertion may be briefly stated as follows:

1. Nasal catarrh.
2. The gradual extension of the inflammatory process from the nasal cavity to the lachrymal sac, viâ the nasal duct, producing during its progress an active oedema of the mucous membrane lining this

*This is the only occasion that I have been able to demonstrate the presence of this organism in the secretion from the many hundreds of cases of conjunctivitis—acute and chronic whether accompanied by dacryocystitis or no—that I have examined bacteriologically.

latter, and thereby causing

3. Either a complete occlusion of the lumen of this tube or a localised stricture.
4. As a result of this obstruction to the outflow of tears and mucus, the lachrymal sac becomes filled and distended.
5. Pyogenic organisms gain admittance to the viscid mass by direct extension from the inflamed membrane of the duct, suppuration ensues and a
6. Lachrymal abscess becomes the outward and visible sign of an inward (and usually supposititious) stricture.

Whilst perfectly willing to admit that a stricture of the nasal duct when present, forms a very obvious predisposing cause of dacryocystitis, I am equally adverse to admit its presence in all or even many of these cases. I am in fact much more inclined to regard stricture of the nasal duct as a result of long continued suppuration of the sac, rather than as directly responsible for the causation of that suppuration.

I have already noted that the canaliculus was slit in cases 7, 10, 13 and 15. In each of them probes were used to ascertain the condition of the duct with regard to the question of patency, and in no instance was this found to be impaired.* The majority of the cases of chronic dacryocystitis were examined in a like manner, and of the cases included in table III. only twice was a stricture found to exist. These remarks do not however apply to numerous cases which were examined, but rejected for the purposes of this investigation on account of the length of time the suppuration has been going on. In such cases stricture was the rule and not the exception.

I have already referred to the fact that the streptococcus longus is invariably present in the serous exudation from the conjunctiva which accompanies cases of acute purulent dacryocystitis; it now only remains to add that this exudation is caused by an acute conjunctivitis which not only accompanies but precedes, by some days, suppuration in the sac. Case 8 affords an excellent and complete example of the course of events; and it would appear that the theory of the causation of acute dacryocystitis, handed down through generations of text-books, should be reversed and the steps of the process described as follows.

*It will be noted that the authorities agree in stating that the stricture is most usually situated at the junction of the sac with the nasal duct—a point where there normally exists a very definite constriction. Given a certain amount of inflammatory oedema of the lining mucosa of the sac, overhanging this constricted orifice and interfering with the passage of the probe, it is easy to imagine the presence of a stricture when such is not the case.

1. Invasion of the conjunctival sac by the streptococcus pyogenes longus, resulting in an attack of acute conjunctivitis.
2. Flushing of the conjunctival sac by lachrymal secretion and the washing of the streptococcus through the canaliculi into the lachrymal sac by the stream of tears.
3. Excessive secretion of mucus and exudation of leucocytes into the interior of the sac in the endeavour to remove the intruders.
4. Invasion of the mucous membrane lining the interior of the sac by the streptococcus; the appearance of the organism in the sub-mucosa and finally in the cellular tissue surrounding the sac, and the consequent formation of pus in those situations to which it has gained access.

BIBLIOGRAPHY.

1. *Nettleship* Diseases of the eye — p. 76.
2. *Morax* L'Etiologie des Conjonctivites aiguës 1894 p. 109.
3. *Mazet* Sur l'empyèmes du sac lachrymal. Annal d'Oculistique, CXIII p. 367.
4. *Parinaud* Conjonctivite à streptocoques — Annal d'Oculistique 1892.
5. *v. Lingelsheim* Ztschr. f. Hyg. X, 331 and XII 308.
6. *Washbourn & Goadby* Some points in connection with the bacteriology of the mouth. Trans. Odontological Soc. of Great Britain 1896 No. 8.
10. *Eyre* On the Xerosis Bacillus — Jnl. of Pathology Vol. IV.

*A PLEA FOR MORE MILD TREATMENT OF THE CONJUNCTIVA.

By E. W. AMES, M. D.

Canton, Ill.

In presenting a plea for more mild treatment of the conjunctiva, I desire to state that I advocate no drugs which have not been numbered among the multiplicity of remedies used in the treatment of affections of this membrane. The combination of drugs which I advocate have been used by me in the treatment of acute catarrhal conjunctivitis, chronic catarrhal conjunctivitis, follicular conjunctivitis,

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phlyctenular conjunctivitis and trachoma with its accompanying pannus. I shall not dwell upon the symptoms, course, etiology and complications of these diseases except as it may be necessary to illustrate therapy.

The remedies which have found most favor and stood the test of time, are the salts of zinc, copper sulphate and silver nitrate, together with some one of the antiseptics. Each of the remedies mentioned is an irritant astringent, and when used in such strength as to be potent for the chronic forms of inflammation, the reaction following the application is long continued and painful. Relapses, with exacerbation of the inflammation while under treatment, are the common experience of every oculist. This always necessitates discontinuance of the astringent remedy until the eye recuperates from the intolerance which it has manifested. While the eye is undergoing this revolt, the lesions are often re-established with such remarkable rapidity, that when the oculist again ventures an aggressive treatment, he may find the condition as far from cured as when the treatment was first begun.

The remedies above referred to cannot, with prudence, be placed in the hands of the patient to be used at home: thus really curative treatment can be applied only at the office, and therefore, much time valuable to the patient may be lost.

To illustrate the treatment which I wish to recommend, we will consider a patient with a severe attack of acute catarrhal conjunctivitis. The secretion has become muco-purulent, the lids are sealed in the morning, and there is the characteristic itching, photophobia and pain.

The conjunctival sac should be flushed with a solution composed of formalin, one part, to two or three thousand parts of boiled water.

The upper lids are then raised, or everted, and the fornix conjunctivae filled with a solution composed as follows: Boric acid gr. v, tannin gr lxxx, glycerin f. dr. iv, distilled water sufficient to make f. oz. i. The pain from the application of this solution is quite severe, but lasts only from one-half to one minute; the patient then complaining only of a "sandy sensation."

The conjunctival vessels become intensely injected, but this rapidly subsides, and in from twenty to thirty minutes the membrane is paler than before the instillation, the eye feeling cool and soothed. The patient may be provided with a vial of each solution and instructed to use the drops every two or three hours when awake. On the following morning there will be but little secretion, the lids not being

sealed and the eye a useful organ. Under this treatment complete recovery takes place in two or three days, providing the acute attack has not been grafted onto a chronic condition. Our authors acknowledge that under the treatment usually recommended this disease is but slightly shortened in its course, the principle aim of treatment being to prevent a chronic inflammation as a sequel. The merit of a therapy cannot be estimated when the experiment is confined to diseases which tend to spontaneous recovery; hence I will devote the balance of my paper to the consideration of trachoma.

Case 1.—About two years ago I was consulted by a poverty-stricken individual who was suffering with trachoma of several years standing. He was fifty years of age, used tobacco in quantity and manner peculiar to an inhabitant of the Missouri River bottoms. Vision and photophobia was such that it was with difficulty that he performed his farm work. The margins of the corneae were covered with pannus. The lids were lined with a thick coat of granulations and entropion was quite marked. He asked for a prescription, stating that he was unable to pay for such treatment as he should have. I prescribed a solution containing boric acid gr. v, tannin gr. xxx, glycerin dr. ii and water sufficient to make f. oz i, and directed him to drop one or two drops into each eye four times daily stop the use of tobacco and when he could afford a proper fee, come to me for appropriate treatment. About four months later I met him on the street, and noticing that he wore his hat well back on his head, having no intolerance of light, I accosted him and learned that he had been having my prescription refilled, and had used it faithfully. The pannus was gone and the corneae were clear. I did not examine the lids.

Case 2.—Nov. 14, 1896, I was consulted by Amos W, age 34, farmer. History.—Left eye sore frequently since a boy at school. Eight months ago the left eye became much worse and the right eye also became affected. Had been treated most of the time since that date. Vision $\frac{2}{100}$ either eye. Diagnosis.—Trachoma; pannus either eye, worse on left; leucoma left, in pupillary area. I advised him to stop the use of tobacco; (which he did not do) and, as he lived ten miles distant, I provided him with a solution composed as follows: Boric acid gr. v, tannic acid gr. xii, glycerin f. dr. i, water q. s. f. dr. iv. Directions.—Drop two or three drops in each eye four times daily. He reported at my office two or three times each week, when I cleansed the conjunctival sac with the formalin solution and instilled a saturated solution of tannin in the equal parts of glycerin and water. All of the distressing symptoms subsided in three days, the pannus cleared away and two months from the date of beginning treatment I discharged the case, cured. He recently came to my office and I found the cure has remained permanent. The lids were thin and pliable, there being no cicatricial contraction which often occurs as a result of strong caustics more than as a result of the disease itself.

Case 3.—Dec. 15, 1896, I was consulted by J. R. R., age 50, had been running an emery wheel in the plow shops for sixteen years. In Feb. 1896, he was compelled to quit his work on account of trachoma. He was treated a

short time by his family physician who then advised him to go to the Hanover Charitable Eye and Ear Infirmary. He was treated at the infirmary four months with some benefit, then was sent home seemingly on account of the institution being over-crowded. His eyes became rapidly worse. He was then treated by a local oculist four months. Complaining that he received no benefit he was discharged with directions to bathe his eyes in hot water several times daily. He followed this advice for about one month, when he came to me with his eyes in the following condition: Vision either eye $\frac{2}{160}$, slight entropion of right lower lid, entropion of left lower lid quite pronounced. Puncti in very good position, epiphora marked, both eyes with a profuse muco-purulent secretion. Slight pannus of right cornea, and quite intense of left cornea. The right upper and lower lids were lined with a thick layer of trachoma granules. The left upper lid was much worse in this respect, having a cauliflower appearance. The case remained at my office during hours and was treated as heretofore indicated from three to six times daily. He was provided with a weaker solution of the depleting astringent which he used at home morning and evening. The purulent secretion had ceased by the second day. At the end of the first week of treatment the vision of the right eye was $\frac{2}{45}$, vision of left eye $\frac{2}{70}$. At the end of the second week the tarsal cartilages were shining through, there being here and there a little tuft of granulations. I now allowed him to resume work in the dusty shop, treating him once daily. At the end of six weeks from the date of beginning treatment the granulations were gone there being only a slight roughening of the tarsal conjunctivae. The epiphora still continued. A marginal pannus which existed at the beginning of treatment had cleared away. I for some time saw the case but once or twice a week when I probed the nasal ducts, having the patient use a 1 to 3000 formalin solution at home. Though I was able to pass a No. 6 probe through the nasal ducts to the floor of the nostrils, the epiphora continued. A slight roughness of the tarsal conjunctivae persisted, with a tendency to increase after the astringent treatment was abandoned. Upon examination of the nostrils I found some hypertrophy of both inferior turbinated bones, a septal spur right and anterior, and hypertrophy along base of septum on left. I removed the spur with a saw and reduced the other hypertrophied parts with the galvano-cautery. When the reaction from the operations subsided, the epiphora became promptly relieved. The slight exacerbation of the conjunctival trouble subsided promptly under a few treatments of the depleting astringent.

I think in this case there not only existed an increased quantity of lachrymal secretion which was caused by reflex irritation from the rhinitis, but there was an actual mechanical obstruction at the lower orifice of the nasal duct due to turgesence of the mucous membrane in the inferior meatus.

I believe oculists do not pay sufficient attention to this condition. There are surely many cases in which mechanical obstruction exists that cannot be accounted for by either stricture or a flaccid condition of the membrane within the duct proper. It is reasonable to suppose that stenosis can occur at the lower orifice of the nasal duct from

causes analogous to those which cause primary closure of the lower orifice of the eustachian tube; yet, how many cases are treated long and patiently without giving attention to the nostril?

I have many other cases which I could report, but the ones which I have cited illustrate that a mild, depleting, astringent and antiseptic therapy for trachoma is worthy your consideration. There is no disease of the eye regarding which such a mass of literature has been produced as on trachoma. This is accounted for by the fact that no satisfactory treatment has been secured. Severe cases have been cured, but the treatment extended over many months and often years; and oft-times the result of the treatment is a cloudy cornea or a cicatricial lid which leaves the patient disfigured for life. Mild treatment has been used as a matter of necessity, as an adjunct to the trachoma forceps, a brush or caustics; but I wish to emphasize the fact that the mild treatment which I have indicated will speedily cure the severe cases, and is not in itself harmful to the eye.

Some of the advantages of the treatment may be summed up as follows: It is quickly curative, it promptly relieves the distressing symptoms. It can be repeated many times daily, thus obtaining a rapidly curative action. It is so mild that it does not interfere with the occupation of the patient, and may with safety be placed in his hands for use at home. Keratitis does not contra-indicate its use. There are no evil sequellae to the treatment, such as, agyrosis and cicatricial contraction. No relapses occur on account of an intolerance of the membrane, necessitating suspension of aggressive treatment.

A REPORT ON PATHOLOGY OF THE EYE.

By **C. DEVEREUX MARSHALL, F. R. C. S., ENG.**

Pathologist Royal London Ophthalmic Hospital, London.

London, Eng.

ILLUSTRATED.

Tension in Intraocular Tumours. The question of Tension in cases of Intraocular Tumour is one to which great importance is attached from a diagnostic point of view and one which is of great pathological interest. Indeed it is looked upon as being one of the most important signs of a tumour and one which is mentioned as being in certain cases almost the one thing needful to clinch the diagnosis.

We find it stated in many works on the eye that if there is a detachment of the retina with increased tension it is almost certain that the eye contains a tumour, while if there is a detachment with dimin-

ished tension this is almost sure to be simple, or at any rate one due to some cause other than the presence of a new growth.

Certain observations, however, led me to doubt the truth of this as one came across so many exceptions to the rule, and in order to determine this more accurately I examined one hundred cases, both after removal and as many as possible before removal also. The results I obtained were so striking that I read a paper on the subject before the Ophthalmological Society of the United Kingdom, and this was subsequently published in the Transactions of the Society for the year 1896.

The cases fall conveniently into three groups :

1. Those containing a sarcoma of the choroid.
2. Those containing a sarcoma which either arises in or secondarily affects the ciliary body.
3. Those containing a glioma of the retina.

The following is briefly what was found :

Of the cases in the first group, which were 53 in number, the condition was :

Increased Tension in 36 or 67.92 %.

Normal Tension in 16 or 30.18 %.

(?) Diminished Tension in 1 or 1.88 %.

By this we see that it is far more common to get an increase of tension in these cases. In only one (and there was some doubt about it) was the tension noted as being below normal, and this was in a specimen which I had not the opportunity of examining before removal. In all these cases the angle of the anterior chamber was either much diminished or entirely closed.

Of the cases in which the tension was normal, the angle of the anterior chamber was open or at the most slightly constricted. In the one which was doubtfully minus, the angle was open. A very different condition existed in the cases in which the ciliary body was involved.

Of the 28 thus affected there was :

Increased Tension in 10 or 35.71 %.

Normal Tension in 14 or 50.00 %.

Diminished Tension in 4 or 14.28 %.

Here the condition of the angle of the anterior chamber followed very closely the rule as above mentioned.

In the cases of glioma of the Retina, which were 19 in number, the condition found was :

Increased Tension in 7 or 36.84 %.

Normal Tension in 10 or 52.63 %.

Diminished Tension in 2 or 10.52 %.

Here again the condition of the angle followed closely the rule.

It is thus seen that in those cases in which the ciliary body is affected, the tension of the eye is on an altogether lower level than when the tension is far back, and also that the tension in the former is very similar to that found in glioma.

Since publishing this paper I have had the opportunity of examining 12 cases of sarcoma of the eyeball.

Of these 10 were of the melanotic variety and two were unpigmented. The ciliary body was only affected in one specimen, although it is by no means the case that sarcomata of this part of the uveal tract are as uncommon in proportion to those of the choroid as this would lead one to suppose. The usual proportion is about 30 tumours either starting in or secondarily affecting the ciliary body to 70 which affect the choroid only.

It has been previously pointed out how uncommon it is to find the angle of the anterior chamber free in cases of tumour affecting the choroid without the ciliary body, and consequently the majority of those in which this condition is present have increased tension. This was found to be so constantly the case that one was almost tempted to lay down the rule that if in an eye containing a growth the tension was found to be diminished, the growth had invaded the ciliary body.

There are, however, but few rules without exceptions, and having recently examined a case which proved an exception, I will here briefly relate it.

The patient was a man aged 56 who complained of failing sight in the left eye, which he had noticed for nine months.

On examination the tension was found to be slightly but distinctly lower than in the other eye; externally everything appeared normal.

On ophthalmoscopic examination, however, a detachment was seen towards the nasal side, and the whole appearance was suggestive of a tumour far forwards. The eye was excised and the following condition was found:

The cornea was healthy, the anterior chamber was rather deep and the angle by no means constricted, but was well open.

On section, the lens were found to be *in situ*, but the retina extensively detached, thus greatly diminishing the vitreous cavity; the detachment extended from the optic disc nearly up to the ora serrata.

Growing from the choroid and occupying about a half of the space beneath the detachment was a pigmented sarcoma of mottled appearance.

The center of its base was at the equator, and at no place did it reach the ciliary processes. Its measurements were 10 mm in height and the same across its widest part, its base measured 7 mm. There was the usual constriction seen about its middle, showing where the elastic lamina of the choroid had been perforated,

and this gave it rather the shape of a mushroom. The optic disc showed no cupping.

The idea that the increase of tension, which by some is always supposed to occur in cases of tumour of the eyeball, must evidently be abandoned, although it is possible that most of these cases, if left entirely to themselves, would at a late stage of their development exhibit glaucomatous signs.

But the point upon which I want to lay the greatest stress is this, viz., that the size of the tumour has practically nothing to do with the intraocular tension, at any rate not while the eye is still under the usual physical conditions of such an organ.

Of course if an eyeball is completely filled with a neoplasm the question of tension does not come in, for then all we can do is to palpate a more or less dense growth, while all the normal functions and physiological relations of the eye are destroyed.

It is a totally wrong impression which ascribes the tension to the fact that the globe has more inside it than it can comfortably accommodate. The vitreous contains so large an amount of fluid that it can by pressure be made to contain very much less, in this way resembling a sponge.

In conclusion, the necessity of carefully examining all forms of intraocular neoplasms must be urged. There are many points of doubt still to be cleared up, both as to the nature of aetiology and these malignant growths, and nothing but a careful and exhaustive enquiry into these matters is likely to advance our knowledge in this direction.

On Subhyaloid Hemorrhages. This is a pathological condition long recognized by ophthalmologists and one which has given rise to considerable discussion as to the exact situation which the blood occupies. It is a condition which, although easy enough to see clinically, yet its minute anatomy is but very imperfectly understood. This of course is due to the great difficulty there is of obtaining specimens for anatomical and microscopic observation.

Such eyes call for no special treatment, and certainly not for enucleation.

The ultimate result may be either the rupturing of the hyaloid membrane, in which case the blood may find its way into the vitreous direct, and after this has happened, such an eye is useless for the special purposes of our investigation, or else the blood becomes gradually absorbed and the eye recovers. The prognosis in these cases is by no means good, for as a rule the patient is suffering from more or

less extensive disease of the vascular system, which may prove fatal at any time.

A very perfect specimen illustrating the points under discussion was kindly brought me by Mr. J. B. Lawford, removed from a patient under his care at St. Thomas's Hospital, and after a thorough examination, both clinical and anatomical, a paper was written on the subject by Mr. J. Herbert Fisher, Assistant Ophthalmic Surgeon to St. Thomas's Hospital, and was published in the Ophthalmic Hospital Reports. Vol. xiv., Pt. ii.

The patient was a woman aged 60 years, who was first seen on April 30, 1895. She complained that the sight had been dim for ten weeks and that it had failed suddenly when engaged in laundry work. Shortly after this she was attacked with severe bleeding of the nose. A month after her first visit she again attended, when the hemorrhage was seen to have altered but little. On being told she could leave she attempted to rise from her chair, but had become paralysed on the right side. She was at once removed to the ward, where she died three days later. At the autopsy a large hemorrhage was seen to have taken place in the internal capsule. The right eye was removed and hardened in Formol 10 per cent, and after this it was divided equatorially. The hemorrhage was clearly visible, lying on or just within the internal limiting membrane of the retina. The whole posterior half of the eye was then imbedded in celloidin and sections were cut and stained in hæmatoxylin and eosin.

The sections show the following condition:

On the vitreous surface of the extravasation there are two membranes running for the most part over the surface of the blood. That nearest the hemorrhage shows some nucleated cells in connection with it, while the other membrane is structureless in character. The first is the internal limiting membrane, while the second is the hyaloid membrane. They run for the most part parallel to each other, and both are on the surface of the extravasated blood; at one point, however, some red corpuscles are seen between the two membranes which are here slightly separated from each other; this shows the situation when the blood has burst through the internal limiting membrane of the retina, but its further progress has been arrested by the hyaloid membrane; this condition is in the macular region. At the end of the section the blood has succeeded in passing through both membranes and is here spread out as a thin layer on the vitreous surface of the hyaloid membrane. The layers of the retina are not themselves infiltrated with blood, thus showing that it was easier for the blood to raise the internal limiting membrane than to find its way between the deeper layers of the retina.

The source of the blood is certainly a retinal vessel, though it is impossible to form any clear idea as to which vessel gave way. Owing to the fact that the internal limiting membrane was stripped off for a considerable distance it may have been from a small artery, though there is nothing in the section to tell whether it is from an artery or a vein. We thus see that the cases of subhyaloid hemorrhage, or at

any rate this case (which was typical clinically) should be classed rather as a retinal hemorrhage, and there is but little doubt that this is a representative case of the disease.

Filamentary Keratitis is a disease which was but little known until recently.

It was first described by Leber in 1882, and the filaments were held by him to be of a fibrinous nature, which became twisted up with the peculiar threadlike processes which are attached at one end to the cornea and hang down on its surface with the other extremity free.

Fischer and Uhthoff¹ noticed that these cases at first developed small vesicles on the cornea, and these very soon burst and then from each of the small ulcers which resulted a small filament appeared. These authors agreed with Leber as to their fibrinous nature.

Carl Hess² and J. P. Nuel³ have shown most conclusively that the small threads are composed, not of fibrin, but of epithelial cells, which have separated from the cornea and have assumed a spiral form.

With regard to the clinical history, we usually find that the disease occurs in old people, often without any recent injury, but frequently there has been some chronic conjunctivitis.

The following case is one which presents several points of interest and one which is very typical of the disease.

The patient was a man aged 66, who was admitted into the Royal London Ophthalmic Hospital, Moorfields, on Oct. 3, 1896, under the care of Mr. Lang, with the following history. The left eye had been blind for five years and the right for six months. Previous to this he had had excellent sight. The right eye had been inflamed and painful for ten days. The general condition of the patient was good, but twenty years ago a dog bit him and caused an ulcer on the leg, which is not yet well. Urine: Sp. Gr. 1016; no albumen; no sugar.

The present state of his eyes are as follows:

Right eye: There is some ciliary injection and slight photophobia; attached to the cornea are numerous small filaments like threads, which hang down with a free lower extremity. The pupil is active. The lens forms a nearly complete cataract. Tension normal. V=Hand movement. Projection good.

Left eye: The Cornea and Iris are normal and there is no injection of the eye. The lens forms a hypermature cataract. Tension normal. V=P. L. Projection good. The left cataract was extracted and the eye did quite well and very good vision resulted.

With regard to the right eye a more detailed description of the cornea is needed.

On examination with the oblique illumination and a strong lens the surface is seen to be rough and uneven, and at the attached or upper end of each filament a

1. Bericht über die versammlung der Ophthalmologischen Gesellschaft. 1892 and 1894.

2. Archives für Augenheilkunde. 1892 and 1893.

3. Archives d'Ophtalmologie. 1892.

small depression is seen. These little threads vary much in length and are of any size between about 0.5 mm and 4 mm.

They can be easily removed with a pair of forceps and scissors. After removal they may be mounted fresh and examined microscopically or they may be first stained.

On Jan. 14, 1897, the right eye was operated upon for cataract and did quite well. In the following March the general health was good, R. V. = $\frac{6}{18}$ J. i. There was then no corneal affection.

At the present time (7 months after the right extraction) the vision of both eyes is $\frac{6}{12}$ and J. i. The cornea is quite healthy and there are no remains now visible of the late trouble.

The condition has now been observed a sufficient number of times to make its nature certain, and I here give a photographic reproduction of one of the filaments.

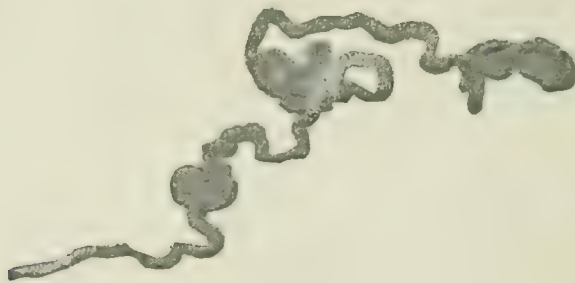


Fig. I.

It is at once seen what a striking resemblance there is between this and the so-called Curschmann's spirals, which are so frequently found in the sputum of patients suffering from various forms of bronchial catarrh, and there is every reason for believing them to be the result of a proliferation and detachment of the corneal epithelium. What exactly causes the filaments to assume their somewhat peculiar shape is perhaps hardly known. Possibly the movements of the eyelids may have something to do with it, but, if so, it certainly must be something very different in the case of the filaments of bronchial origin.

The disease is sufficiently uncommon to justify me in recording such, but at the present time its ætiology is obscure. It is always associated with some corneal ulceration, and judging from the photophobia and other accompaniments of the disease it is very suggestive of its being of a neuropathic origin in connection with the fifth nerve and closely associated with herpes. When first seen the vesicles upon the cornea look very much like those which are so familiar in all forms of herpetic eruptions. In conclusion I wish to express my thanks to Mr. Lang for permission to publish this case.



Fig. II.

Diagram (high power) of a Filament, from J. P. Nuel.

CORRESPONDENCE.

CONCERNING THE COMBINATION OF CYLINDRICAL LENSES.

TO THE EDITOR OF THE OPHTHALMIC RECORD.

Sir:—In the August number of your journal appears an article entitled "The Combination of Cylindrical Lenses, and its Optical Effect, by David Kletsky." A perusal of this very surprising contribution would seem to indicate that its author was hardly prepared to undertake the discussion of the problem to which it relates. The results set forth are so utterly at variance with the truth, that were it not for the implied sanction which your publication has given them, their serious refutation would be unnecessary.

The solution of the "cylindrical problem," although not particularly difficult, is hardly as simple as the author of this paper seems to

imagine, and if he had taken the trouble to attempt the practical verification of his tables, their inaccuracy would have been immediately evident. It is true that the problem is not discussed in many text books on the eye. Its practical importance is not such as to warrant its presentation to beginners.

The combination of a plano-concave and a plano-convex cylindrical lens with equal and opposite rotation about a common axis, the angle included between the axes of their refractive surfaces varying from 0° to 90° , has been familiar for at least thirty-five years under the name of 'the astigmatic lens of Stokes.' The solution of the general problem relating to the refractive value of any two combined cylindrical surfaces is given by Donders, and has since been performed by other writers.*

This solution may be expressed in the following equations:

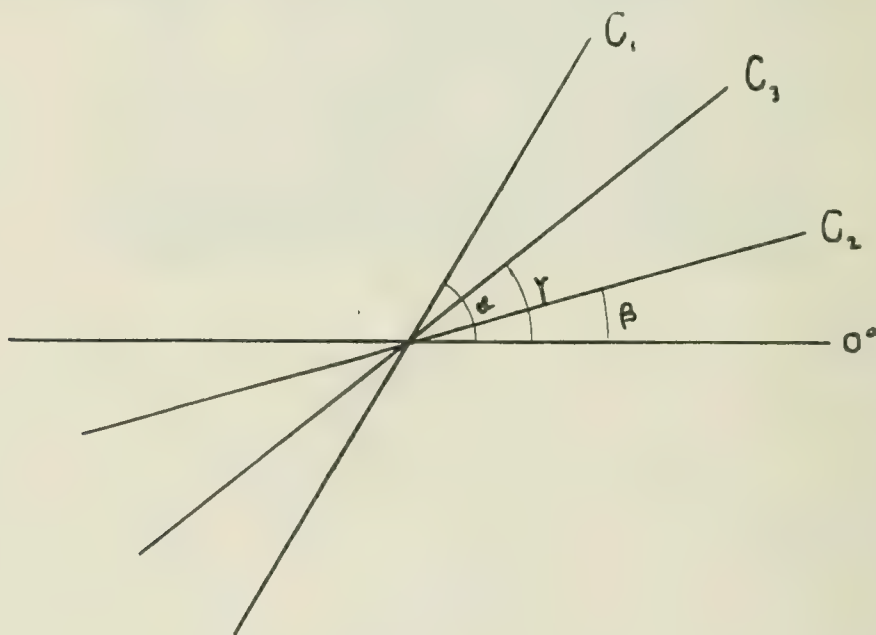


Fig. 1.

$$\tan 2\gamma = \frac{C_1 \sin 2\alpha + C_2 \sin 2\beta}{C_1 \cos 2\alpha + C_2 \cos 2\beta} \quad (\text{I.})$$

$$C_3 = \frac{C_1 \sin 2\alpha + C_2 \sin 2\beta}{\sin 2\gamma} \quad (\text{II.})$$

$$D = \frac{C_1 + C_2 - C_3}{2} \quad (\text{III.})$$

*Donders. On the Anomalies of Refraction and Accommodation, 1864. p. 499-500.

Jackson: Trans. Amer. Oph. Soc. 1886. Hay: *ibid.*

Weiland. On the Refractive Value of Any Two Cylinders etc. Arch. of Oph. Vol. XXII, 1893, p. 485.

Also by Hoorweg, Oliver, Heath and others.

C_1 is the dioptric value of the first cylinder which makes an angle α with the meridian O^0 .

C_2 is the dioptric value of the second cylinder, which makes an angle β with the meridian O^0 .

C_3 is the dioptric value of the resulting cylinder, making an angle γ with the meridian O^0 .

D is the dioptric value of the spherical lens which added to the value of C_3 gives the sphero-cylindrical equivalent of the combination.

Applying these formulae to the "Stokes lens," and assuming that the meridian O^0 bisects the angle included between the axes of the cylinders.

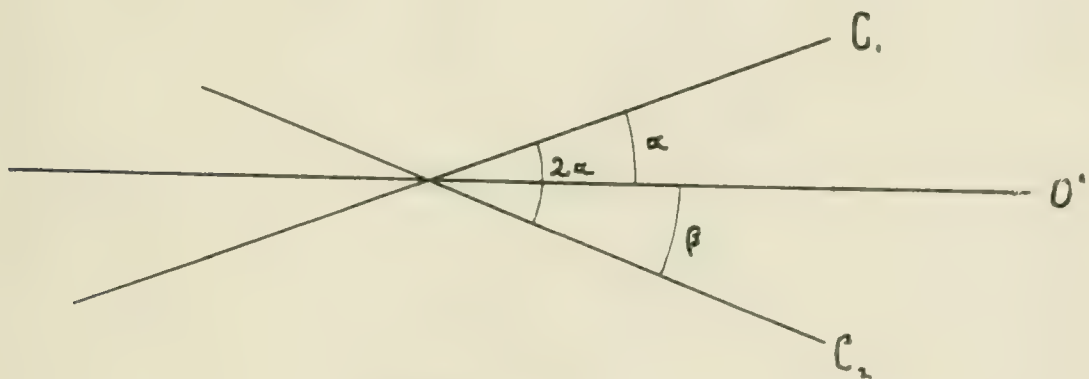


Fig. 2.

Angle $\alpha = \beta$, whence $\sin 2\beta = \sin 2\alpha$. $C = C_1$.
Substituting these values in (I) we have,

$$\tan 2\gamma = \frac{2 C_1 \sin 2\alpha}{C_1} = 2 \tan 2\alpha$$

Therefore $2\gamma = 90^\circ$. and

$$\gamma = 45^\circ. \quad (A)$$

Substituting the above in (II) we have

$$C_3 = 2 C_1 \sin 2\alpha \quad (B)$$

where 2α is the angle included between the axes of the cylinders.

$$D = \frac{C_3}{2} \quad (C)$$

Now from (A), (B) and (C), the sphero-cylindrical equivalent of the Stokes lens may readily be calculated for any assumed values of C_1 , C_2 and 2α .

Thus, assuming $C_1 = 2.25 D$, $C_2 = 2.25 D$, the following table may be constructed:

Angle between axes = $2a$	Equivalent crossed- cylinders.	Equivalent sphero- cylinder.
10°	$-0.39 \text{ ax } 135^\circ \bigcirc + 0.39 \text{ ax } 45^\circ$	$-0.39 \bigcirc + 0.78 \text{ ax } 45^\circ$
20°	$-0.76 \text{ ax } 135^\circ \bigcirc + 0.76 \text{ ax } 45^\circ$	$-0.76 \bigcirc + 1.53 \text{ ax } 45^\circ$
30°	$-1.12 \text{ ax } 135^\circ \bigcirc + 1.12 \text{ ax } 45^\circ$	$-1.12 \bigcirc + 2.25 \text{ ax } 45^\circ$
40°	$-1.44 \text{ ax } 135^\circ \bigcirc + 1.44 \text{ ax } 45^\circ$	$-1.44 \bigcirc + 2.89 \text{ ax } 45^\circ$
50°	$-1.72 \text{ ax } 135^\circ \bigcirc + 1.72 \text{ ax } 45^\circ$	$-1.72 \bigcirc + 3.45 \text{ ax } 45^\circ$
60°	$-1.95 \text{ ax } 135^\circ \bigcirc + 1.95 \text{ ax } 45^\circ$	$-1.95 \bigcirc + 3.90 \text{ ax } 45^\circ$
70°	$-2.14 \text{ ax } 135^\circ \bigcirc + 2.14 \text{ ax } 45^\circ$	$-2.14 \bigcirc + 4.28 \text{ ax } 45^\circ$
80°	$-2.21 \text{ ax } 135^\circ \bigcirc + 2.21 \text{ ax } 45^\circ$	$-2.21 \bigcirc + 4.43 \text{ ax } 45^\circ$
90°	$-2.25 \text{ ax } 135^\circ \bigcirc + 2.25 \text{ ax } 45^\circ$	$-2.25 \bigcirc + 4.50 \text{ ax } 45^\circ$

Now if the cylinders are equal in refractive power and are both convex, assuming $C_1 = C_2$, $a = 90^\circ - x$, $\beta = 90^\circ + x$, (Fig. 3.)

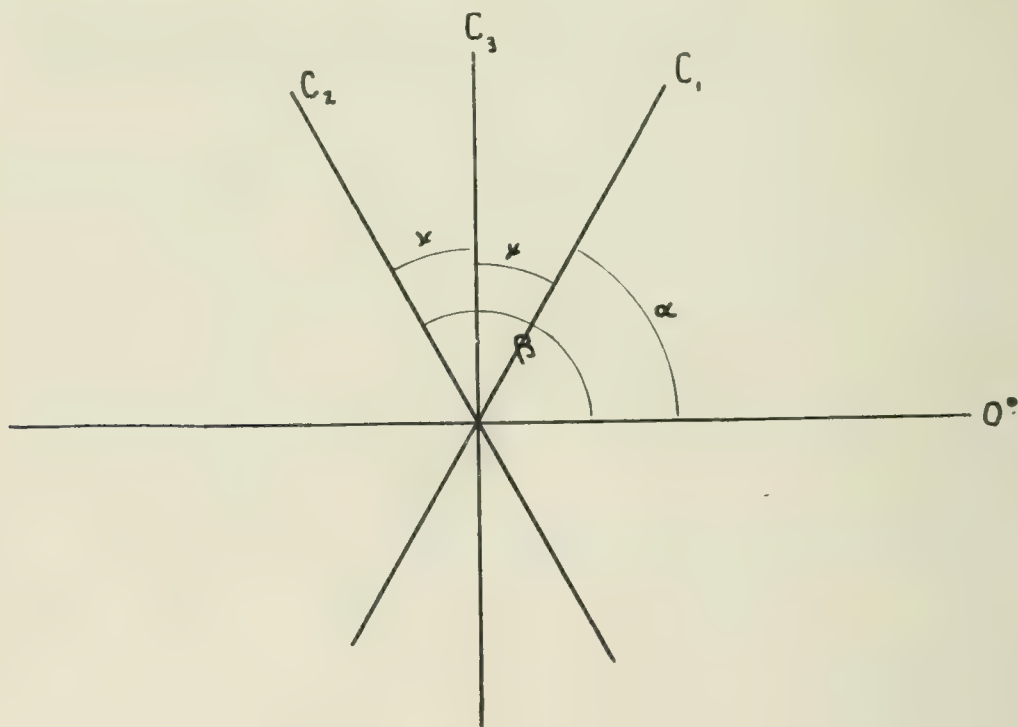


Fig 3.

Substituting these values in (I), we have

$$\tan 2\gamma = 0$$

$$\gamma = 90^\circ \quad (a)$$

In obtaining the value of C_3 , if we use the equation

$$C_3 = \frac{C_1 \sin 2a + C_2 \sin 2\beta}{\sin 2\gamma} \quad (II).$$

its value becomes ∞ , and is therefore indeterminate, substituting then the above values in

$$C_1 = \frac{C_2 \cos 2\alpha + C_1 \cos 2\beta}{\cos 2\gamma} \quad (VI)$$

$$\gamma = 90^\circ, \cos 2\gamma = 1, \cos 2\alpha = \cos 2\beta$$

$$C_1 = 2 C_2 \cos 2\alpha \quad (b)$$

$$D = \frac{C_1 + C_2}{2} - \frac{C_1 - 2 C_2 - C_1}{2} \quad (c)$$

From these equations, (a), (b) and (c) we may construct the following table:

When $C_1 = C_2 = 1.50 D$, and $\gamma = 90^\circ$, $\alpha = 90^\circ - \gamma - \beta = 90^\circ + \gamma$.

Angle α .	Equivalent sphero-cylinder.
90	0.00 \ominus + 3.00 ax 90°
85°	+ 0.02 \ominus + 2.95 ax 90°
80°	+ 0.09 \ominus + 2.82 ax 90°
75°	+ 0.20 \ominus + 2.60 ax 90°
70°	+ 0.35 \ominus + 2.30 ax 90°
65°	+ 0.50 \ominus + 1.99 ax 90°
60°	+ 0.75 \ominus + 1.50 ax 90°
55°	+ 0.98 \ominus + 1.03 ax 90°
50°	+ 1.24 \ominus + 0.52 ax 90°
45°	+ 3.00 \ominus 0.00 ax 90°

Other tables can be similarly constructed. I have given these because the values of C_1 , C_2 , α and β are those taken by Dr. Kletsky in the article referred to.

Very respectfully yours,

HAROLD WILSON, M. D.

32 West Adams ave., Detroit Mich. August 23, 1897



REVIEWS.

What Are the Functions of the Rods and Cones and the Pigment Epithelium Layer of the Human Retina? By Frank P. Pratt, M. D., in *The Medical Record*, Aug. 28th, 1897. The generally accepted theory is that both the rods and cones are the terminal cells of the optic nerve; that the image of external objects is focused upon this layer, and that here light vibrations are changed into another kind of motion, namely, nerve stimuli; that certain mechanical and perhaps chemical changes take place in the epithelial pigment layer, and that a peculiarly intimate relation exists between this layer and the layer of rods and cones.

Fuchs says that the place in which the conversion of luminous vibrations into nerve excitation occurs is the rods and cones. I wish to present the following hypotheses:

1st. That the cones alone are the terminal cells of the optic fibres in the human retina.

2nd. That the rods are supporting tissues to the cones, their outer segments practically forming a part of the pigment epithelial layer.

3rd. That the tenth or pigment layer is that in which light vibrations are changed into nerve stimuli.

A full consideration of the microscopical anatomy of the retina would be impossible here, on account of the limited space; reference, therefore, must be made to the text books of anatomy and histology. Piersol's article on "Microscopical Anatomy of the Retina," and May's on "Photo-Chemistry of the Retina," in Norris and Oliver's work, cover the field very fully.

Assuming then, that this histological knowledge is in mind, we will review only such salient points as are necessary to make clear the foundation for the propositions above presented.

The retina of the old school comprised the nine innermost layers only, or that part which includes the fibres and terminal cells of the optic nerve, together with the internal limiting membrane. Later research has demonstrated that the epithelial pigment layer also belongs to the retina, and constitutes its tenth stratum. This layer is in intimate relation with the ninth, and, together with the seventh and eighth layers, has no blood vessels of its own, but receives its nourishment from the same source—the choroidal vessels. The rods

and cones alike pass through the cribriform external limiting membrane, the rods extending to the "base" of the epithelial cells, where they terminate in irregular "gnawed off" ends; the epithelial cells sending down protoplasmic processes between the rods and cones to various depths; or this epithelial "base" may be considered as a "disc," which is perforated with cylindrical channels for the reception of the external segments of the rods. Thus the outer rod cell is plunged deeply in the pigmented portion of the epithelial cells. This relation of rods and epithelial processes is maintained uninfluenced by the light stimulus. The cones also pass outward and terminate in gently rounding ends, which reach little more than half-way to the "base" of the epithelial cell. The cone is not a fixed cell, but under the influence of its normal stimulus retracts, so that the whole cell is nearer the external limiting membrane. When this stimulus is removed the whole cell again advances. This is an important difference, and should be given its proper weight in a consideration of the functions of the rods and cones. Authorities differ as to whether the terminal cell is connected to the nerve fibre by continuity, or simply by continuity or approximation. Hosch, however, claims that he "finds in the Golgi silver preparations evidence of direct anatomical continuity between the fibrils proceeding from the base of the cone cell and the processes of the nerve cell." No such continuity has been demonstrated or claimed for the rod. What proofs, then, have we that the cones alone are the terminal cells of the optic nerve in the human retina? Consider in this light the following facts: 1st. That the cones alone have been demonstrated to be connected directly with the filaments of the optic nerve. 2nd. That no such claim is made for the rod; in fact the base of the rod is known to terminate in a bulb, and approximation is its only relation to the nerve filaments. 3rd. That the cone is mechanically irritated by converted light stimulus, as shown by its power of contraction and extension under that stimulus. 4th. That converted light stimulus has no mechanical effect upon the rod; that its close relation to the base of the epithelial cell remains unchanged under its influence. 5th. That the only change noted in the rod cell is that which occurs in the bleaching and reproduction of the so-called visual purple, which has its exclusive seat in the outer segment of the rod cell, and this bleaching appears to be effected by the action of the luminous vibrations themselves, and not by the proper nerve stimulus. Light vibrations as such are not excitors to the terminal cells of the optic nerve. 6th. That the cones alone

occupy the the position of most acute vision. 7th. That the rods are not necessary to acute and perfect vision. 8th. Because in central scotoma the disease involves only that portion of the retina which has to do with acute vision, namely, the macular region; yet a cross-section of the optic nerve, where it enters the bulb, shows an accompanying atrophy of nerve filaments, which occupy a sector-shaped space, with base out and apex towards the center, and make up nearly or quite one-third of the total nerve filaments (Fuchs).

When we consider what a small part of the retinal surface the macular region occupies and how insignificant numerically the cones of this region are compared with the combined rods and cones of the extra-macular region, it not only adds weight to the belief that each cone in this region has an individual nerve fibre, but also to the fact that each cell element of the extra-macular region cannot have an individual nerve fibre, nor one fibre for seven cells, as estimated by Selzer and Krause. These authorities estimate the cones at 7,000,000. Becker estimates 13,000 in the macula lutea. The rods are much more numerous, being estimated as high as 130,000,000 by Krause. Selzer and Krause estimate the number of measurable fibres of the optic nerve at 425,000. Now taking out the 13,000 fibres distributed to the macular cells, there remain 412,000 fibres to be distributed to 137,000,000 extra-macular cells. If these were distributed to both the rods and cones there would be 1 fibre to 332 cell elements; if to the rods alone, 1 to 301; if to the cones alone, 1 to about 17. These estimates furnish additional evidence that the cone cells alone receive filaments of the nerve.

9th. That the normal position of the cone is at right angles to the external limiting membrane and the pigment epithelial layer. That this position can be thus maintained, outside of the macular region, only by appropriate supporting tissue.

In the macular region each cone is a support to its neighbor, therefore no rods are necessary. In the extra-macular region the cones become farther and farther apart towards the peripheral portions of the retina; they can no longer support each other, therefore rods appear, and with the protoplasmic processes of the epithelial layer and the modified lymph, fill in the intervening spaces. The rods, which in the macular region form a single layer around each cone, gradually increase in number, until, in the region of the ora serrata, each cone is surrounded by three or more layers of rods. The outer segment of the supporting rod, as it dips deeply into the pigment processes of the epithelial layer, thus becomes practically a part of that layer.

10th. That in proportion as the cones increase in number over a given area, vision increases and vice versa. Thus the cones within the macula lutea are many times more numerous than in any other equal space on the retina. Therefore, more terminal filaments being irritated, sight is more acute.

The third general proposition is that the tenth retinal layer is that in which light vibrations are changed into nerve stimuli.

Briefly stated, the tenth layer is composed of a single stratum of hexagonal cells, a view of the inner surface of which shows a beautiful mosaic arrangement, deeply pigmented, except in the region of the nucleus. A vertical section shows the cell to be divided into three parts or zones—the outermost containing the nucleus, and being unpigmented, a middle zone deeply pigmented, sometimes known as the “base” of the cell, and an irregular zone of “indefinite protoplasmic processes,” extending between the outer segments of the rods and cones. This pigment is special and peculiar to this layer; it differs from the stroma pigment of the choroid in being crystalline and rod-shaped instead of granular. Under the influence of light these pigment crystals advance within the protoplasmic extensions of the “base” of the cell, between the rods, the migration not being accompanied by the protraction and retraction of the processes themselves.

I present the following reasons for believing the third general proposition to be true: 1st. The pigment epithelial cells increase in size from the region of the fovea, where they are the smallest, to the region of the ora serrata, where they reach the maximum size, thus coinciding with the decreasing number of cones from center to circumference, so that it is probable that when the ninth and tenth layers are in their normal position each cone points to the center or nucleus of each epithelial cell. 2nd. The peculiar yet significant associated action of the epithelial pigment and the cone cell, under the influence of light stimulus, as the pigment advances within the epithelial processes, the cone retracts, and vice versa, their relative positions being little changed. 3rd. The position of the cone is strong evidence that the image is not formed upon this layer. Nature is a conservator of forces; then why does she not turn the cones towards the source of light, if the layer is the necessary surface upon which the image is cast, instead of turning them in the opposite direction? In the one position the image would fall directly upon the percipient surface; in the other the light rays pass through the nine different retinal layers to accomplish the same purpose, if the accepted theory is true.

Nature has made no mistake. The cones are turned towards the source of their normal stimuli, but this stimulus is not light vibration, as such, and therefore does not come from the object itself; it is another form of energy. "This is, without a doubt, simply another sort of motion, of such a nature as to be transmitted within the nerve fibres to the brain—a property which is not possessed by the vibrations of luminous ether" (Fuchs). Thus it would seem that "vibrations of luminous ether" must pass unobstructed through the various retinal layers, including the cones, until they are focussed upon the tenth layer, which point is a murky "veil" at the focal point of the normal eye, fixed between the delicate terminal cells of the optic nerve and the choroidal coat. It is the ground-glass plate of our living camera, upon which the images in our visual field are spread in all their various colors, and in which, in a manner not yet fully understood, light vibrations are transferred into nerve stimuli, and from which comes the normal stimulus of the ocular fibres. It is well known that the anatomical and histological arrangements of tissues are not the same in different vertebrates—thus, in the frog rods may predominate in the region of the most acute vision, or that rods alone, or perhaps modified cones, may alone be present in others, or that a complete decussation of the optic nerve fibres takes place in some of the lower animals. Yet this does not warrant us in assuming that the above facts do not hold true in man. In the words of Fuchs, in speaking of the decussation of ocular fibres: "The only mistake that has been made in assuming the same condition to hold good for the higher vertebrates also."

It is not claimed here that pigment is necessarily present in order that this change from light vibrations to nerve stimuli may take place, for in albinos, in which pigment is absent, the visual act is accomplished, yet always imperfectly. It is, therefore, probable that in exceptional cases some modification in the pigment substance takes place, yet always at the expense of perfect vision.

Much has been said about the visual purple or rhodopsin of Boll. Yet when all is said, little or nothing is known of its real utility. We know that it exists exclusively in the outer segment of the rod, that even in the cone cell of the extra-macular region it is not present. That it is not essential to perfect vision is evidenced by the fact that it is absent in the region of the fovea. "Animals that have been deprived of visible purple do not act differently from those which possess it. Frogs without this visible purple search for their favorite color, green" (May). In fact, it may act, owing to its position, in common with the elements of the pigment layer in absorbing and transforming luminous ether vibrations into normal nerve stimulus.

E. OLIVER BELT.

REPORTS OF SOCIETIES.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held October 12th, 1897, Dr. Montgomery in the chair.

Dr. W. H. Wilder showed a man of 50, with a good family and personal history, whose mother had suddenly become blind after suffering severe pain. In August, 1896, the patient noticed that vision in the left eye became very poor, and blood was seen at that time in the anterior chamber. There was no pain then, but it developed soon afterwards. There was detachment of the retina, which is now complete. He consulted a number of oculists, some of whom called it an iritis, and others glaucoma. Six months ago an iridectomy was done upwards, and following the operation there was considerable pain and hemorrhage. At present the tension of the eye is slightly increased and there is slight pain. There is a large amount of fluid blood in the anterior chamber, which has been there for a long period. The lens is cataractous. About a week ago well marked pain suddenly developed, and three days later there was found on the cornea three small vesicles overlapping each other like the three links of a chain, probably a true herpes.

Dr. Hotz thought the case was hardly one of hemorrhagic glaucoma because of the great depth of the anterior chamber and of the slight, if any, increased tension. He had always found the chamber very shallow in cases of hemorrhagic glaucoma.

Dr. Montgomery had seen a case six months ago in which the tension was $+3$; but there was no hemorrhage. The anterior chamber was deep. A tumor was suspected, and an iridectomy was made following which the tension dropped to normal, and there was perception of light. Recently, however, the tension had again gone up and hemorrhages had appeared in the anterior chamber.

Dr. Colburn had seen cases in which there was retinal hemorrhages, followed later by blood in the anterior chamber. In regard to the vesicles in this case he had seen several, but none where they were arranged in this way. He had noticed in some cases of choroiditis that vesicles appeared at times, usually accompanied by great pain.

Dr. Montgomery had seen cases of complete detachment develop pain from glaucoma, or from uveitis.

Dr. Gradle had found uveitis not uncommon in detachment cases, but had never seen glaucoma following.

Dr. Hotz had never seen glaucoma follow detachment of the retina.

Dr. Oscar Dodd showed the case of an ulcer on the palpebral conjunctiva, which was first seen three weeks ago, at which time there was no swelling. The ulcer was small, and the discomfort had existed about a month. It slowly extended and soon involved the whole surface including the edge of the lid. The lid is now considerably swollen. Nitrate of silver and other antiseptics had no effect on the ulcer, and although a history of syphilis was denied, it is probably a chancre.

Drs. Montgomery, Hotz and Pinckard had all seen cases of chancre of the conjunctiva following the removal of the foreign body by means of the tongue

Dr. Henry W. Woodruff of Joliet, showed a boy who was struck on the left eye on the fourth of July. He was first seen a month later, at which time there was a cataract and a small cyst in the upper outer periphery of the iris, very well defined, and occupying about a third of the breadth of the iris.

He referred to another case he had recently seen in a man 55 years old with good vision, whose pupil dilates well except at the point of the cyst. As far as could be determined this was a congenital condition.

Dr. Dodd had studied two cases of cyst of the iris with Treacher Collins of London, both of which were traumatic. Such cysts are supposed to develop by some from the crypts in the iris; by others from a hemorrhage in the periphery, which later develops into a cyst.

Dr. Gamble showed a case of locomotor ataxia in a girl of eight years, first seen May 17th, 1897. Vision in the right eye, fingers at three feet, and left eye p. 1. Ophthalmoscopic examination showed primary gray atrophy of both discs with marked atrophic cupping. Pupils dilated; no reflex to accommodation or light. Patellar reflexes gone; Romberg's symptom much pronounced. No nystagmus. She never had any severe illness except diphtheria when one year old, which was not followed by sequelae. She had severe headaches from infancy at irregular intervals, vary from one month to six months. During one of these attacks her hand became so numb that she could not feel the doorknob and open the door. No cerebral disturbance

noticeable; no girdle symptoms. Was examined by Dr. King, who found no change in sensation.

The father was examined in the latter part of May and found to have primary gray atrophy of the discs. He had had a chancre in 1871. He was also examined by Dr. King, who made a diagnosis of locomotor ataxia.

Dr. Gamble showed a case of sarcoma of the ciliary body involving also about one-third of the iris. As far as could be determined, this had existed only a few months.

Dr. Wilder showed a case of dermoid tumor of the cornea.

Dr. Hotz had seen several true cysts of a dermoid character occurring on the cornea.

Dr. Hotz read a report on Holocain. This paper will appear in December number of the OPTHALMIC RECORD.

Dr. Hale said it is reported that holocain is in itself an antiseptic and will keep indefinitely.

Dr. Pinckard referred to the new form of eucain called eucain B, and had found it very satisfactory in his experience, there being little or no pain attending its application. It will keep indefinitely and will stand boiling without changing its character.

C. P. PINCKARD, M. D.

Secretary.

THE OPHTHALMIC RECORD

A Monthly Review of the Progress of Ophthalmology.

VOL. VI. CHICAGO, NOVEMBER, 1897. NO. 11. NEW SERIES

EDITORIALS.

HOSPITAL ABUSE.

"The County of New York has at the present time 26 hospitals and 114 dispensaries. During 1895 in the former 75,386 patients were treated free and in the latter 661,803 making a total of 737,171. The population of the city is 1, 851,060 so that the proportion of such free patients to the whole community is thirty nine per cent. Dr. Landon Carter Gray made the preceeding statement during an address delivered before the New York County Medical Society last September. The total number of patients treated by physicians without pay throughout the United States must be something enormous if Dr. Gray's figures are to be taken as representing a true state of affairs. To anyone who is at all familiar with even a few of the many papers which have lately appeared in our medical journals discussing a subject which has been very well termed "The Abuse of Medical Charity" there can be not the slightest doubt that a considerable proportion of the population apply for and receive medical treatment although they have the ability to pay for the same. The hospital and dispensary should be considered simply as a place where the sick can receive the necessary treatment that they are unable to obtain in any other way, but the policies of the administrations have gradually yielded to the tendencies of the times so that now many of our large institutions are so easily accessible and so admirably arranged that they permit the handling of large numbers of patients with remarkable celerity. As a justification of the Stewardship the reports are expected to show an increase in attendance year by year. The physician on account of the limited time at his command is powerless to eliminate, except in rare

instances, those who have come to be known as "Unfits." It is therefore not surprising that under the circumstances a large and constantly increasing class in the community should come to finally regard the advice so easily obtained as theirs for the asking. The governing boards of institutions should realize the injustice that is being worked upon the profession at large, the younger members in particular, and endeavor in some way to bring about a mitigation of the evil. The length of an illness, the character of an injury, or the loss of time involved largely affects the question as to what constitutes an abuse of medical charity; for while the care and attention requisite in managing a case of typhoid fever might be beyond the financial possibilities of an individual, the same person might be perfectly able and willing to pay a moderate fee for the relief of some slight ailment, as for example the correction of an error of refraction. In this connection it might be well to emphasize the importance of concerted action on the part of ophthalmologists with view of restraining this desire of the public to avoid a just obligation, for the wide spread knowledge of the nature of the work done at an eye hospital, the attractive appearance of the surroundings together with the ease and precision with which the examinations are carried out, both inspires confidence in the patient and likewise arouses a feeling that treatment obtained at such a place is especially to be desired; and it is not to be wondered at that the daily attendance should be composed of so many who as they readily admit come "because it is the best place." This class which includes no small part of the "Unfits" is usually perfectly reasonable when explanations are given as is also the class which believes that the "Hospital Doctor" occupies a salaried position and therefore does himself no harm by treating without pay, those who are able to remunerate him. The unpleasant patients however are those who have applied for treatment knowing their own ineligibility, and who intend to resort to subterfuge to gain the desired end. Although a few words will set the well intentioned right one of the latter class frequently become argumentative and at times even abusive which would naturally if necessary carried out by a properly constituted executive officer suggest that some place more suitable than a clinic room be used for this purpose. When deceit is so openly practiced to attain the end in question a rigorous method of interrogation should be resorted to and delegated for the position and responsible to the hospital management and not to the staff of physicians. By this arrangement will the staff be relieved of the imputation of cupidity and the managers better fulfil

the conditions of the various trusts imposed upon them by the benefactors of the institutions. How often are we reminded that our professional training is our "stock in trade" and that the money therein invested should make returns in the nature of an adequate professional income but how little real influence does this have in affecting the professional behavior of the physician in the practice of his profession. The legal profession provide no such conveniences for the gratuitous dispensing of advice, indeed their system is so well arranged as to even prevent competition from unworthy sources of information. The manufacturer would be rather amused than otherwise were it suggested to him that he devote two hours each day in relieving the worthy poor by donations from his stock room and I doubt if the capitalist would be willing to relieve present necessities by loans of money on undoubted security without interest. The feelings of the writer are of the kindest towards the unfortunate and he is also most heartily in accord with those who are endeavoring to render the burden they carry less heavy but he wishes to join with others in an indignant protest against the too frequent examples of indiscriminate charity of which many of us are so familiar.

W. D. H.

THE OPHTHALMIC RECORD

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NO. 12, NEW SERIES.

ORIGINAL ARTICLES.

PANOPHTHALMITIS AND MENINGITIS ACCOMPANYING LA GRIPPE.*

By C. D. CONKEY, M. D.

West Superior, Wis.

Interesting as is the subject of acute inflammatory processes arising in the cranium and in the deeper tissues of the eye simultaneously or consecutively it is not my purpose to enter extensively into its discussion. It is my aim simply to describe the usual sources of infection, the channels through which it travels to reach the organs involved and finally to relate the history of a violent attack involving both structures whose chief interest consists in the very unusual apparent source of infection. Most writers agree that acute meningitis is always due to an infective process reaching the cerebral membranes usually directly from without but sometimes through the blood. Chronic suppurative middle ear disease with caries, mastoid disease, disease of the nasal sinuses and diseases of the orbit and injuries to the bones of the head are the common sources of infection from without, while from the common infectious diseases such as pyaemia, pneumonia, variola, scarlet fever, rheumatism, measles, typhoid fever and mumps is conveyed the septic material through the blood to the brain. Suppurative choroiditis is developed by causes not at all unlike those producing inflammation of the meninges, and spring from sources external to the body or through direct infection of the blood. When arising from without, the eye must have suffered from some injury or disease involving its outer coats such as perforating wounds, corneal abrasions, cicatricial tissue with entanglement of the iris, etc. When arising from within it may

*Read before Wisconsin State Medical Society

be due to septic emboli becoming fixed in the vessels of the choroid which spring from a suppurating centre (Fuchs) such as pyaemia, from a suppurating ear or sinus, (2) by the extension of inflammation from a phlegmon in the orbit, and (3) by the transfer of the inflammatory process from the meninges along the course of the optic nerve to the eye during an attack of acute meningitis

The great majority of cases seen spring from causes external to the body. As the eye is subject to injury with great frequency it is not surprising that septic infection of the choroid is by no means uncommon. As abscess of the orbit is itself uncommon, the cases arising from this cause are very few. Meningitis quite frequently causes an inflammatory process in the choroid, but the cases springing from this cause are as a rule of a mild type seldom injuring the shape of the eye ball and not always completely destroying the sight of the affected eye. This class of cases is almost entirely confined to childhood. Those cases springing from septic emboli are very few indeed and occur in the course of pyaemia, scarlet fever, typhus, erysipelas, malignant anthrax and ulcerative endocarditis. Fuchs mentions influenza also as a cause of this disease. I have searched the literature of this strange disease since its advent into our midst in 1889 and while I find that the eye has suffered as much as any single organ, I can find no reference to suppurative choroiditis as one of its complications. While the history of the case given below is not as clear as I should have liked, antedating my first visit, upon which to base a diagnosis, it still points quite clearly to La Grippe as being its exciting cause. The patient had no suppurating centre in her body, so far as I was able to find. Her ears, nose and uterus were free from suppurative disease, nor was she suffering from any of the diseases noted above. The following is the history of her case:

Upon the 20th of January, 1892, when an epidemic of La Grippe was at its height in this city, I was called to see Mrs. J. M., a woman of about thirty-six years, the mother of three children. Until one week previous she had enjoyed excellent health. At that time she was suddenly taken sick. She was much prostrated from the first and complained of violent pain along the entire length of her spine. At times the pain was most severe in the dorsal region, but it shifted from point to point and finally it became extremely severe in the cervical and occipital regions. She also complained of a severe pain in the eyes and temples, especially upon the right side. Upon the 18th, 2 days before I saw her, the pain in the spine subsided but the pain in the right side of her face became much aggravated. Upon this date she noticed that her eye was becoming inflamed. It grew rapidly worse, and upon the 20th I found it in the following condition: The conjunctiva was decidedly oedematous, covering the peripheral edge of the cornea, and bulging

forward to such an extent that when the lids were closed it protruded between them. The cornea presented no abrasions, but was hazy in appearance. The contents of the anterior chamber had a muddy appearance, evidently purulent. Iris dull in appearance and contracted. Unable to obtain a view of the fundus. Red reflex could not be seen by oblique illumination. Vision, light perception only. Patient complained of severe pain in the eye. Temperature quite high with rapid pulse. Patient perfectly rational and gave a clear history of her case. I could discover no source of infection as she was not suffering from disease of ear, nose or any other organ. Her uterine functions were perfect, nor was she pregnant. I diagnosed her case as panophthalmitis, a sequellae of some constitutional disease from which she was suffering, in all probability La Grippe.

Upon the 21st I found no improvement in her general condition while the eye was even more violently inflamed. The oedema had become so great as to bulge forward between the lids, while the anterior chamber was full of pus.

Upon the 22nd found the same violently inflamed condition of the eyeball. Temperature 105, pulse rapid. Patient talked excitedly and was evidently bordering upon delirium. Dr. Beebe saw the case today and pronounced it La Grippe.

23d. Found patient in a bad state. Pulse not so rapid, nor was temperature so high; but mind was very excited and at times she was delirious. It begins to look as though the meninges were becoming involved. Still had much pain in the eye and inflammation was very great, though there was a constant application of iced cloths.

24th. Patient's eye was no better and her mind was in a very confused condition. From this time on her condition gradually grew worse. When it became apparent that the eye was entirely lost, free and deep incisions were made across its equator. Some pus escaped and a free hemorrhage took place. This was repeated a second time two days later, after which the inflammation in the eye subsided rapidly and soon ceased to be a disturbing factor in the case. During this time the patient was passing through the various stages of meningitis. Her temperature ranged from 102½ to 105, except when controlled by antipyretics. She was delirious most of the time, though at times rational. She complained of much pain in the head, which was partially controlled by the ice cap. For a few days she was wildly delirious, but later became quiet and indifferent, and previous to her death lost all consciousness, which continued to the end. Patient died upon the 5th of February, just seventeen days after the first symptoms of panophthalmitis began. Dr. C. S. Beck saw the case constantly with me. A post-mortem examination was refused.

The point of greatest interest in this history is the very unusual source from which the destructive inflammatory disease of the eye and meninges sprang.

That the patient was suffering from a severe attack of La Grippe there can be but little doubt, and it is also evident that it antedated the eye trouble by nearly a week. A number of cases of meningitis have been reported as sequellae to La Grippe, but they were all of a mild type, and permanently recovered. The severity of the cerebral inflammation in the case just reported, and the purulent condition of

the eye lead us to believe that there existed a similar purulent involvement of the meninges. It is also evident that the eye became involved, first through the circulation and from it the septic process was conveyed to the cranial cavity, along the sheath of the optic nerve. However, a second septic foci may have developed in the meninges simultaneously with that occurring in the eye, but on account of its location was slower in making itself manifest. Of the two views I incline to the former.

OCULAR AFFECTIONS IN GENERAL DISEASES

—A REPORT.

By ROBERT L. RANDOLPH, M. D.

of Baltimore, Md.

A Contribution to the Ocular Disturbances in Infantilism (Microsomia) and Acromegaly by Prof. W. Uhthoff, Berliner klin. Wochenschr. Nr. 22-23 25, 1895 — Few observations have been made with reference to the ocular changes in myxedema (cretinism) and Prof. Uhthoff brings forward an interesting communication in this connection. The patient was a child fourteen years old who had ceased to develop since her ninth year. The thyroid gland had almost entirely disappeared. The skin was rough and suggested the condition met with in ichthyosis. There was no evidence of myxedema but on the contrary the child was emaciated and there was a peculiarly thin and atrophic condition of the skin. The intellect was unimpaired. There was temporal hemianopsia with progressive atrophy of the optic nerve and hemianopic pupillary reaction. Uhthoff's explanation of the case is as follows. A degeneration and atrophy of the thyroid gland occurred in early childhood (say about the ninth year) and this condition lead to the retarded development of the child and secondarily to an enlargement and degeneration of the pituitary gland, which in its turn caused the high grade of visual disturbance. The most remarkable fact in this case was the complete standstill in the growth of the child which had taken place as has been said in the ninth year. Two or three symptoms which are not commonly met with in myxedema would justify us in putting this case in a class by itself though undoubtedly there are strong reasons for believing that it is in some way allied to myxedema one of these reasons being the peculiar character of the visual field which undoubtedly points to an affection of the pituitary gland.

By bringing forward physiological and anatomical data and even

drawing upon pathological facts Uhthoff convinces one of the close relationship existing between the thyroid and pituitary glands.

Two interesting cases of acromegaly are reported. In the first case the papilla on the right side was abnormally white but the left eye was normal. In the second case both papillae were normal, but the fact was demonstrated in both cases that there was present pronounced temporal hemianopsia. This condition is to be regarded as an almost invariable one in acromegaly whenever the optic tracts are concerned and this rule holds good for all tumors of the pituitary gland.

The ophthalmoscopic condition in acromegaly is atrophic discoloration of the papilla while neuritis is very rare only ten cases of this character having been observed. The ocular disturbances in such cases are clearly explained by the pressure exercised upon the affected nerves by either the enlarged pituitary gland or the tumor in that region as the case may be and the sharply defined character of these visual disturbances makes them valuable diagnostic symptoms with reference to the localization and extent of the intracranial changes in acromegaly.

Spasms of the Ocular Muscles in Tetanus. By Dr. Karl Kunn, of Vienna. *Deutsch. med. Wochenschr.* 24 Juni, 1897.—Practically little is known of the symptomatology of spasms of the ocular muscles in tetanus because those who have written on the subject of tetanus have given little attention to the eye symptoms. In 1895 Kunn gave a complete description of spasms of the ocular muscles as seen in tetanus and his description is probably the first thorough one that was made up to that time. He has recently reported three more cases.

The picture presented by these spasms is typical, he thinks, of tetanus. The spasms may come on spontaneously or they may be induced voluntarily. They can be associated with spasms in other parts of the muscular system or they be isolated. They last for varying lengths of time, and may involve all of the ocular muscles. Sometimes convergent strabismus is seen and the patient is unable to rid himself of this condition. The pupils contract ad maximum and so does the ciliary muscle. The bulbar conjunctiva becomes red and there is lachrymation. Pains of a drawing character are often felt and the upper lids may droop and resist all efforts at elevation. When the attack is over everything returns to the normal condition. In the first case the spasms persisted becoming rarer all the while for a year after the subsidence of all the tetanus symptoms. The spasms differ from those

described by the same author as characteristic of athetosis in that the former involve also the muscles within the eye as is shown by the extreme myosis and indistinctness of vision. Diplopia was sometimes seen. The observations of Kunn form a valuable addition to the symptomatology of tetanus, a disease the rarity of which probably explains why we have heard so little of its ocular manifestations.

Disturbances of the Ocular Muscles in Multiple Sclerosis by Dr. Karl Kunn of Vienna. *Klin. Rundschau*, 1896, Nr. 20.—Kunn speaks of several symptoms which he observed in six cases of multiple sclerosis, symptoms which hitherto have not been described. In three of the six cases he observed the "fixation tremor," and five times dissociation of the ocular muscles was present that is to say there was true concomitant strabismus without the slightest lack of motility of the eyeballs together with diplopia, just as one sees in concomitant strabismus. A third symptom consisted in the inability to read or even to work on fine objects. Among other symptoms the patients complained of seeing a fog before the eyes and of the letters moving about the page. Lowered visual acuity for the distance was met with in greater or less degree. This is to be ascribed to the constant trembling of the pupil (described by Parinaud) seen in multiple sclerosis and which is a secondary symptom, due to similar movements of the ciliary muscle. This condition of the ciliary muscle is supposed to consist in a true ataxia of the muscle.

On the Occurrence of Retinal Hemorrhage after Middle Age and its Bearing on the Duration of Life. By Hasket Derby, M. D., Boston. *Boston Med. and Surg. Journal*, July 22, 1897.—Derby attaches great significance to retinal hemorrhages when they are found after middle life and in support of his views gives the histories of thirty one cases. The youngest of these cases was forty three and the oldest eighty three and all of them were the subjects of retinal hemorrhage. Twenty five of the cases died after brief illnesses, some indeed with the utmost suddenness. Eleven died of heart disease and fourteen of apoplexy. A retinal hemorrhage occurring after middle life while it may not always portend danger is an important symptom and one which increases in gravity with the age of the patient. Early diagnosis and the consequent recognition of the possibility of sudden death not only leads to the settlement of business interests (and herein lies the practical point) that in the event of an unexpected demise might suffer but causes advice to be given that may sensibly prolong the days of the patient. Auscultation thus suggested might detect

the presence of an hitherto unsuspected lesion. In any case suitable diet, leading a regular life and above all the avoidance of exhausting work or excessive mental activity have lengthened many a life thus threatened. Derby's observations are valuable and certainly no one will disagree with his conclusions.

Hemorrhagic Retinitis in Hysteria. Report of a Case, by M. Sauvinaeu. Societe d'Ophtalmologie de Paris. Seance du 6 avril 1897.—The case was that of a girl 19 years old who had been the subject of hysteria for a long time. Her heart was sound and there was no evidence of either albuminuria or diabetes. The day after an hysterical attack her vision became suddenly dim. In the left eye there were to be seen grayish streaks along the retinal vessels which looked like exudates and several hemorrhages one of which had a diameter of a small lentil. The fundus of the right eye was normal. The field of vision was narrowed for white and for colors. The condition was probably to be attributed to disturbances in the vasomotor system, having the effect of increasing blood pressure and causing a sudden congestive stasis in a vascular system already enfeebled by chlorosis.

Remarks upon some Ocular Troubles depending upon the General Condition. By Dr. Emile Berger. Archives D'Ophtalmologie. T. XVII. No. 8.—This observer reports four cases of disturbances in vision in patients who had just recovered from severe constitutional affections. Berger does not think however that the ocular disturbances should be attributed in his cases to the constitutional affection but to the neurasthenia or hysteria which had developed in the course of this affection. In the first case the patient had had yellow fever and presented characteristic symptoms of neurasthenia developed in his case during convalescence. In the second and third case the visual disturbances consisted in an hysterical amblyopia which was due neither to the "Caisson Disease" nor to the "Addison's Disease" (with which the second and third case were affected respectively) but to a concomitant hysteria which had passed unnoticed in view of the gravity of the principal diseases. In the fourth case where hysterectomy had been performed for the purpose of curing hysteria the operation not only failed to relieve but on the contrary provoked an amblyopia and hysterical attacks of weakness or failure of sight (copyopia). From these observations one would conclude that in eye troubles following general diseases a careful examination will often reveal a neurasthenic or hysterical origin for the ocular disturbances.

Interstitial Keratitis in Acquired Syphilis. By M. Trousseau. *Presse med.*, 15 mai. 1897.—This observer reports eleven cases of interstitial keratitis in acquired syphilis. The affection differs in some points from the form seen in hereditary syphilis. It is very frequently unilateral. The cornea becomes opaque in small islets scattered here and there and which gradually become confluent. There is less tendency to vascularization and less inflammatory reaction. Specific treatment is rapidly beneficial.

Spontaneous Effusion of Blood into the Eye in a Case of Hereditary Haemophilia. By Prof. Wagenmann. *Archiv für Oph.* Bd. XLIV, Ab. I. The case reported by Wagenmann is an exceedingly rare one. The patient was a bleeder and belonged to a family of bleeders. The application of an artificial leech to his temple had provoked long and obstinate bleeding. The hemorrhage here was spontaneous and consisted of an effusion of blood into the anterior chamber, and probably into the deeper structures of the eye. Resorption took place slowly and was often interrupted by the appearance of fresh hemorrhages. The condition led to blindness. The case would seem to show that when we meet with severe intraocular hemorrhages spontaneous in character we should inquire closely into the personal and family history of the patient and be on the lookout for congenital haemophilia.

Successive Blinding of Both Eyes through Extraocular and Intraocular Hemorrhage, in a Case of Haemophilia. By Albrecht von Weber. *Ibid.*—Von Weber's patient was a young man who had suffered an injury to his right eye. The boy was a bleeder. The injury had been followed by profuse hemorrhage into the skin of the lids and conjunctiva and also from the nose and mouth and later on from the stomach. Sight was destroyed. Eleven years afterward hemorrhages in the retina of the other eye occurred and in a similar manner blindness followed.



OPHTHALMIC MEMORANDA.

By G. E. de SCHWEINITZ, M. D.,

Philadelphia, Pa.

ILLUSTRATED.

I. Absorption of the Pigment after Bloodstaining of the Cornea.

—The early history of this case has already been reported.* An abstract of this record, briefly, is the following:

On the 28th of February, 1896, a girl aged three and a half years, was brought to the Jefferson Medical College Hospital for traumatic hernia of the iris. The child had received a wound of the right eye from a pair of sharp scissors at the corneo-scleral junction, through which there was an extensive prolapse of the iris. There was little irritation and the anterior chamber had been restored, but as the prolapse appeared to be increasing, it was abscised. The operation was followed by a smart hemorrhage which filled the anterior chamber. A pressure bandage was applied and the child was put to bed. At the end of twenty-four hours, absorption of this blood had taken place, but partly owing to the extreme restlessness of the patient, successive hemorrhages occurred, and when she was dismissed from the hospital three days later, at the request of her parents, although contrary to our advice, the anterior chamber was so full of blood that all underlying tissues were obscured. One week later there were distinct symptoms of cyclitis, a fine flush surrounding the corneal margin. Under atropin and the internal administration of small doses of calomel, this condition subsided. Indeed, the cyclitis disappeared in spite of the fact that in the meantime the child was attacked with measles and passed through the ordinary phenomena of this exanthem. As early as the tenth day after the operation, and very markedly after the attack of measles, we began to notice a discoloration of the cornea. This increased until there was typical bloodstaining of the cornea, which caused this membrane to assume a greenish-brown color, with the exception of a small rim, two millimeters in diameter at its circumference.

The patient was not again seen for fifteen months, when the following changes had taken place: the blood-staining had disappeared except in the very centre of the cornea where a small oval patch of brownish hue with sharply marked edge could still be discerned, especially on employing oblique illumination, but even this patch was translucent and the iris could everywhere be seen, as well as the coloboma in its lower portion.

It should be remembered that the original pigmentation was so complete that the entire cornea, with the exception of the rim two millimeters in diameter at its circumference, had assumed a deep, greenish-brown color, absolutely hiding all tissues lying beneath it.

This observation exactly confirms one which has been made by Mr. E. Treacher Collins,† also a case of discoloration of the cornea following hemorrhage into the anterior chamber after removal of a prolapsed iris. The cornea in this case cleared from the centre to the periphery and became entirely translucent at the end of two years, al-

*Philadelphia Polyclinic, 1896, Vol. V, No. 36; The Medical News, New York, July 3, 1897.

†Trans. Ophth. Soc. U. K., 1895, XV, p. 94.

though at the end of one year there was still a grayish patch about four millimeters in diameter. The first signs of clearing were noted fifteen days after the accident.

In my own case it was possible to discern at the end of a few weeks an increase in the width of the narrow rim of cornea which was not originally stained. With this clearing from the periphery, there was a condensation, so to speak, of the pigment in the centre. It seems evident, then, although disappearance of the pigmentation in blood-staining of the cornea begins early, fully eighteen months or two years must elapse before the cornea assumes complete transparency.

II. Glaucoma Three Years After Extraction of Cataract by the Combined Method: Contraction of the Visual Field with Gradual Loss of Vision in Spite of Eserine and Paracentesis of the Cornea.

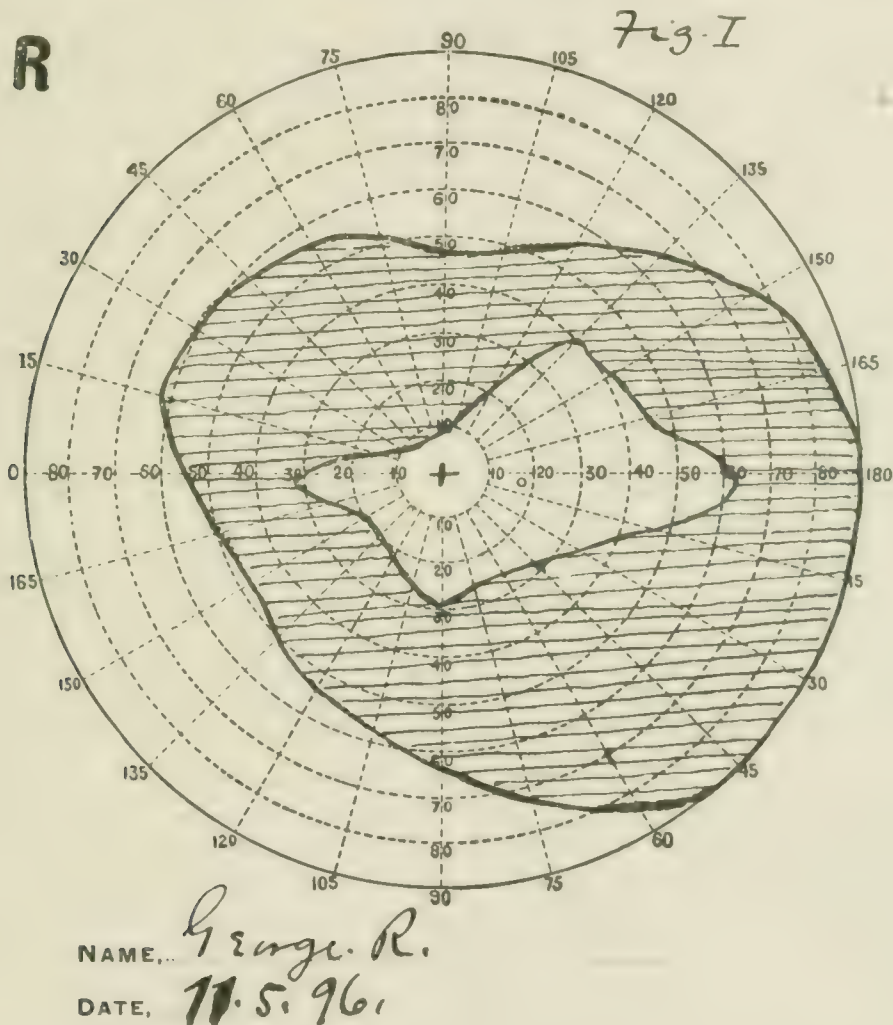
—Glaucoma as an occasional complication after discission, occurring according to Knapp in about 2 per cent. of the cases, is well recognized and its treatment by eserine locally, morphia and chloral internally, or if these measures fail, by iridectomy, usually successful. Glaucoma may also complicate cataract extraction after severe iritis with numerous posterior synechiae and the formation of a membrane. As is well-known, under the same circumstances it also follows iritis which is characterized by a deep anterior chamber and dotted opacities on the cornea; or occurs after an iritis which is only slight in character when there has been an adherence of the pillars of the coloboma to the cicatrix and also to the lens capsule. Although glaucoma after cataract extraction more commonly appears soon after the primary operation, and is associated with types of iritis such as have been described, it may also develop as a very late complication. This subject has received attention recently in a paper by Pagenstecher, and in a most interesting communication by Dr. S. C. Ayres.* Five cases are reported, glaucoma appearing in one in the left eye eleven and in the right eye twenty years after operation; in another two years and in a third two months after successful cataract extractions. To this series of cases I add the following:

George R., a healthy man, aged 58, reported for treatment October 8, 1893, having in the right eye a ripe, white cataract and in the left eye a partially opaque lens. Three days later the cataract of the right eye was removed by the combined method. The cortex was fluid; there was no accident. Convalescence was rather slow and there was a very slight incarceration of the left pillar of the coloboma in the edge of the wound. Six weeks after extraction vision with $+8.s \subset +5.c$ axis 165 was $\frac{9}{16}$. There was a large opening in the centre of the capsule and the fundus

*Archives of Ophthalmology, 1897, XXVI. No. 2, p. 208.

was normal. Three months later the following combination was accepted: $+11^s$ $\ominus +4^c$ axis 165, V $\frac{6}{8}$; with $+4$ added, J I readily. This glass was worn for somewhat over a year, when a still weaker cylinder was required, namely, $+3^c$, the axis remaining the same, and with this glass the vision was $\frac{6}{8}$.

The patient was not seen again until the 5th of October, 1896, or just three years after the primary operation, when his vision was found to be $\frac{6}{80}$, a fine dotted haze through the cornea obscuring the fundus; tension $+?$. The field of vision showed a distinct contraction upon the nasal side. After the use of eserine the



vision rose to $\frac{6}{15}$. The nature of the difficulty was explained, operation was advised, but the patient preferred to try medicinal measures, namely, eserine and iodide of sodium. He returned at the end of a month, his vision having materially depreciated; in fact, he was scarcely able to count fingers and the visual field was contracted in the manner shown in the diagram. Fig. 1. The haze in the cornea had increased and the tension was $+1$. Consent to perform paracentesis was obtained, but little or no improvement in vision followed the operation.

The cataract on the left side had in the meantime completely ripened, and as the patient understood that his chances of obtaining vision were very much better

from an extraction of this cataract than from further operative interference on the glaucomatous eye, he decided in favor of extraction, which was performed by the combined method. The healing was perfectly normal, and after a discission six weeks subsequent to the extraction his vision with $+11^s \subset +2^c$ axis 15 was $\frac{6}{6}$.

Under the influence of eserine and the internal administration of iodide of sodium, the haze in the cornea of the glaucomatous eye gradually disappeared permitting ophthalmoscopic examination, which revealed a greenish, completely cupped disc and contracted bloodvessels. $V = \text{nil}$.

It is interesting to note in this case that there was a small prolapse of the iris in the angle of the wound, a prolapse, however, that was entirely innocuous for three years, during which the patient enjoyed perfect vision. He first noticed beginning depreciation of sight after a very hot summer, during which he was accustomed to read for long periods of time, sitting in the open air, and, as was explained by a member of his family, exposed to the glare of a good deal of sunlight. Whether this was the determining cause of the process which eventuated in glaucoma is purely a matter of conjecture. Had the patient come for consultation during the early period of his glaucomatous symptoms, it is not unlikely that prompt operative interference would have saved his sight, but although he noticed his visual disabilities in July, he did not appear for treatment until the following October; and even then deferred operative interference for another month.

III. The Development of Myopia as an Ocular Symptom of Diabetes Mellitus.—Although changes in the refractive condition of the eye during the course of diabetes mellitus have been observed not infrequently and a number of examples recorded, the subject has perhaps not received the attention which it deserves, and the report of the following cases as good examples of symptomatic myopia is warranted.

Case 1 Myopia Developing During the Course of Diabetes in a Man aged 51; Clear Media; absence of Fundus Changes—In June, 1891, the patient at that time aged 47, consulted me for the relief of failing vision incident to beginning presbyopia. Save for a slight veiling of the edges of the discs, which were rather gray-red in color, there were no fundus lesions. Each eye was hypermetropic, $+1.25 D$; the pupils were normal; there were no insufficiencies of the ocular muscles.

The patient was not seen again until the 10th of May, 1895, when he came complaining not of any lack of the power of his reading glass, but that objects at a distance were daily growing more indistinct. The vision which four years before had been normal, was now scarcely one-half and it required -0.50^s to give him full vision acuity. The media were clear and the discs not more hazy than they had been at his original visit four years before. Minute examination of the vitreous with the aid of successively stronger convex lenses failed to reveal morbid elements. Suspecting sugar in the urine as a possible exciting factor in this case, the patient was urged to seek general medical advice. He consulted Dr. James Tyson,

who found all of the usual symptoms of diabetes. He has kindly furnished records of the following examinations of the urine:

<i>May 11th</i> , 1895,	a. m. urine; specific gravity	1046;	sugar	5.5 per cent
	p. m. " " "	1035;	"	5.5 "
<i>May 17th</i> , 1895,	a. m. " " "	1025;	"	5 "
	p. m. " " "	1030;	"	2.5 "
<i>June 17th</i> , 1895,	a. m. " " "	1027;	no sugar	
	p. m. " " "	1030;	"	"

It is interesting to observe in this case, which is typical of others occurring during diabetes, that the ophthalmoscope failed to reveal any decided lesion, although, no doubt, Knies is correct in his statement that spontaneous short-sightedness appearing between the ages of forty and sixty years among diabetics when there is no opacity of the lens, may be attributed to a diffuse affection of the choroid, in which the pigment epithelium is slightly or not at all affected, but the sclera is softened and yields. In other words, choroidal affection not certainly demonstrable by the ophthalmoscope may be assumed. It is possible, too, that the ametropic changes in such cases may be explained, as Charles Oliver has sought to explain the transient myopia of iritis, by a perversion of the lens action from spastic accommodation as the result of ciliary irritation.

2 **Rapid Increase of Myopia in a Girl Aged Twenty Suffering from Diabetes; Choroidal Oedema and Secondary Hyalitis**—The patient, a pallid studious girl, consulted me in the latter portion of 1895 for the relief of brow headache, worse after reading or other close ocular work. There were no changes in the fundus of either eye, save perhaps an undue grayness in the deeper layers of the discs. There was a small congenital posterior capsular opacity in each eye. After atropine mydriasis the following combination was found to be the correcting glass

O. D. = 0.25⁺ — 0.75⁺ axis 135, $\frac{1}{16}$.

O. S. = 0.62⁺ axis 15, $\frac{1}{16}$.

The patient was not seen for six months, when she came complaining that for the past month her vision had rapidly been growing worse, following hard upon a somewhat prolonged illness. The urine was found to contain sugar, and on correspondence with her physician, Dr. James Wikoff, of Princeton, it was further ascertained that the diabetic symptoms had first become manifest shortly after her original visit, and that ever since the urine had contained large quantities of sugar, although there had been some improvement under proper diatetic management and the internal administration of arsenic.

Ocular examination at this date revealed in the right eye, where there had previously existed a slight mixed astigmatism, a myopia of 3 D, and in the left eye in which there had been a slight simple myopic astigmatism, a myopia of 2 D. Concave sphericals of these denominations added to the astigmatic lenses yielded a vision in the right eye of $\frac{5}{2}$ and in the left eye of $\frac{5}{16}$. There was a somewhat fluffy appearance of the choroid, perhaps indicating the beginning of the oedema which later became a marked feature.

Iodide of sodium was added to her treatment, and she returned in three months with her vision about the same as at the last record. Now the oedematous condition of the choroid was pronounced and fine vitreous opacities could be detected, especially in the right eye. A month later the myopia of the right eye remained the same, but in the left eye had increased to — 5 D, and the fundus changes previously described were slightly more marked. The patient was not again seen, and not long afterwards died.

During six months there was an increase of refractive power in one eye amounting 5 D and in the other to 3.25 D, the greater bulk of the ametropic change having occurred during one month. The ophthalmoscope revealed, even in the earlier stages of the affection, a distinctly oedematous appearance, or what has been called under similar circumstances a diffuse affection of the choroid, which is no doubt the underlying pathological process in most of these cases.

CASE SIMULATING TUMOUR OF THE BRAIN IN WHICH
THERE WERE PRESENT HEADACHE, VOMIT-
ING AND OPTIC NEURITIS, WITH
REMARKS.

By ALFRED J. HORSEY, M. D., M. R. C. S. ENG., L. R. C. P. ED.

Ottawa Ont., Canada.

B. H. Telegraph operator, single, aged twenty-six years, spare habit of body, rather pale but not distinctly anemic. At no time has had any serious illness or injury. No specific history, hereditary or acquired, none of blow or fall, no ear affection or trouble in eyes before. No neurotic attacks of any kind. Nothing noteworthy in family history. Has of late had headaches and weak stomach with frequent vomiting, paroxysmal in character.

Complains that sight in right eye has been gradually failing for the past three months; so that it is with great difficulty she continues her work. It was on account of failing sight that her medical adviser referred her to me—on Feb 18th, 1895.

There was no pain felt nor external changes to be seen in the eyes; pupils were equal and responsive to light. R. V. $\frac{20}{20}$, while the left was $\frac{3}{20}$. The ophthalmoscope showed marked optic neuritis in the right. The papilla being swollen about two millimeters.

The vessels were seen to make great sweeping curves over it; the veins being enlarged tortuous and dark when they descended the sides of the papilla, while their light streaks were absent.

The margins of the disc for their whole circumference were obscured by red and grey streaks, the disc itself being pale and hazy with a few small straight vessels upon its surface.

There were no hemorrhages to be seen, nor any changes in the retina beyond the disc.

The left eye presented nothing morbid; was emmetropic in retraction and normal in vision.

Iodide of Potassium was ordered in gr. v. doses three times daily and she was to continue an iron tonic given by her medical adviser.

She was also to discontinue work which she did for six weeks only, as she was most anxious to retain her situation. By March the 6th marked abatement of the swelling and inflammation of the disc had taken place and vision had improved so that she could read $\frac{3}{80}$ fluently with the right eye.

By March the 16th the swelling of the disc had further subsided so that its edges were becoming discernable, vision still $\frac{3}{80}$ in the right eye.

On May 21st vision was found to have somewhat relapsed, $\frac{3}{80}$ could be read with difficulty.

The iodide of potassium and iron were taken more or less constantly till the end of the year, work had been continued which she now could do with less fatigue than previously.

Headaches and vomiting still continued but less frequently—they never had been very severe, were unexplainable and paroxysmal, she attributing them to "bilious attacks."

She was lost sight of for several months when on Jan. 22nd, she again consulted me because of failure in the other (left) eye that is nearly a year after she came to me for the right eye and more than a year after the sight had been noticed to fail.

The ophthalmoscope showed unmistakable papillitis (optic neuritis) presenting features very similar to those seen in the right eye but of a less intense character; the vision of which had deteriorated to $\frac{3}{80}$ which before had been normal. The vision in the right eye had now improved to $\frac{1}{2}$. She still continued at work, the left not causing nearly so much disability as the right eye had done. In six weeks it began to clear and in a few weeks more resumed the normal in appearance and vision. As it continued to be on Oct 5th '96. When seen by request on March 1st '97, her general health was fair, but still had headaches referable to the front of the head, vision in right eye $\frac{3}{80}$ in the left $\frac{3}{80}$.

Both discs had now almost wholly cleared, the right looked somewhat pale and the edges blurred. It had lost its swelling and the vessels their curve, the arteries had not shrunk there were no light streaks accompanying them, or connective tissue changes visible.

P. S. Patient by request seen just before sending this to press, expressed herself as being in better health than a year ago—but looked pale and fatigued, still continued her work as a telegraph operator. Headaches less frequent and severe, vomiting ceased. Is able to read some of the letters of last line of Snellen's wall type at six meters with either eye. Papillae appear normal.

The case amongst other things goes to show that even chronic optic neuritis is not invariably a sign of central tumour clinically such cases are of importance as they simulate disease of the brain and their occurrence however rare detracted somewhat from the significance of optic neuritis as a sign of intracranial disease.

Sir. W. R. Gowers in his recent clinical lectures on the nervous system; says, "the chief and first significance of optic neuritis is the

presence of organic disease, if you can exclude a blood state or constitutional condition, you may feel sure that there is a recognizable organic change within the skull or orbit."

But this is not so readily done as there are several known conditions of the blood which give rise to it. Amongst these are anemia which may cause most intense neuritis which in a few weeks yields to the administration of iron. Bright disease is another cause of it, often without the characteristic retinal affection. Lead poisoning is another cause of it. Both Cooper and Sir Hughlings Jackson think hypermetropia may cause it. "Though Sir Hughlings Jackson states that tumours within the skull are the common cause of optic neuritis, they may exist without it, so that it may occur with tumours of any part; and may not occur with tumours in any part of the brain.

In the face of such evidence from such authorities as these quoted the case was regarded with considerable gravity. Then upon rightly determining the causation, depended the treatment which was to influence the ultimate prognosis as to vision or even life itself. The papillitis being unocular or more correctly speaking was so for nearly a year before the other eye became affected made its interpretation less comprehensible. In considering it after the lapse of time it is more reasonable to regard it as one in which the manifestation in the second eye was delayed rather than that of one-sided papillitis; the causation being the same in each. The precedence according to good authority being a few weeks, both eyes being involved together one in a stage in advance of the other. Practically when first seen and for several months afterwards the case was one-sided, the rarity of which may be inferred by the statement of Sir. W. R. Gowers that, "the only case in which he had seen it in brain disease was one in which the tumour was so situated as to prevent fluid which distended the optic nerve sheath from passing along the sheath.

Dr. Hughlings Jackson at a meeting of the *Oph. Socy. of the United Kingdom* as reported in the *Lancet*, spoke of the rarity of O. N. in physicians practice, especially in tumours of the brain; proved post-mortem."

The foregoing knowledge taken along with that of Mr. Marcus Gunn in "Heath's Dictionary of Surgery, that it is usually dependant upon a local cause, orbital cellulitis, periostitis or tumours of the orbit though it may occur in association with intra-cranial tumour at the optic foramen or on the optic nerve," made me regard the case somewhat less gravely, yet there was nothing in the case we are consider-

ing to indicate disease of a local character in the orbit, no proptosis, no abridgement of motion of the globe or periostitis or cellulitis, again Dr. W. R. Gowers in his clinical lectures before quoted says, "that it is rare for optic neuritis to be one-sided. It is one of the symptoms that occurs on both sides at the same time because as a rule its cause is either an influence from the brain which acts equally on the two sides or an influence from the blood which has an influence so general that its effects are bilateral."

"Sir. H. Jackson says there are usually three things that go with cerebral tumour: Optic neuritis, headaches, vomiting, though they may all be absent."

This case presented all three of these in a fairly prominent degree yet the subject of it after two years and a half is in fair health and follows her usual occupation, so we may reasonably conclude she has not tumour of the brain commonly speaking—though possibly has had some coarse adventitious product within the cranium, or that it was due to a blood condition. That we are justified in attributing it to syphilis without some further evidence, that it cleared up while taking iodide of potassium is not warrantable as there are other conditions which are dissipated by iodide of potassium that are not syphilitic—so from a diagnostic point cannot be said to be proven. To give potassium iodide when the neuritis is dependant on anemia may be fatal to sight as tissue changes may occur which would have been stayed by iron. As to anemia being the cause there are some unreconcilable conditions. Iron had been taken several weeks before coming to me without improvement. Its long one sidedness which is against a general condition that it should at length clear up on one side, and the other become involved while she was taking iron and iodide of potassium is not indicative of a blood causation, but should consider it less so of anemia than syphilis.

The cause of the O. N. in this case was to my mind undetermined and that treatment influenced it is doubtful. Iodide of potassium was given because it might be dependent upon some syphilitic growth—and the iron allowed to be continued to improve the blood.



ON THE USE OF EPITHELIAL LIP-FLAPS AND HALF-SKIN FLAPS IN EYE SURGERY.

By **H. Gifford, M. D.**

Omaha, Nebraska.

ILLUSTRATED

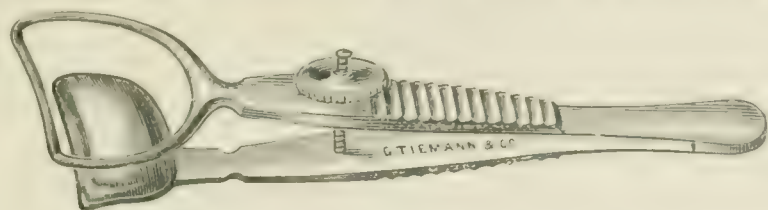
By epithelial lip-flaps, I do not mean mucous flaps obtained in the ordinary way, with knife or scissors and forceps, for these, even when carefully trimmed on the under side, contain practically the whole thickness of the mucous membrane. The flaps to which I refer correspond, histologically, for mucous membranes, to the Thiersch skin-flaps; and they are obtained by exposing and rendering tense the inner surface of the lip or some other mucous membrane; and, with a sharp razor, cutting a flap so thin that only the epithelium and a very little of the subjacent tissue is removed. Such flaps have only a narrow range of application but within that range, namely, in replacing ocular, and, in some cases, palpebral conjunctiva they are unrivalled; and the results which I have obtained with them during the last three and a half years have been so excellent that I feel like urging their more general use.

For the cure of entropium, as in Van Milligan's operation, these epithelial flaps are far inferior to the ordinary thick lip-flaps; but the latter, when grafted upon the surface of the eye-ball, retain a fleshy appearance which makes them very undesirable from a cosmetic point of view. I have used the epithelial flaps chiefly in operations for symblepharon; to replace conjunctiva excised with new growths; in some cases of xerophthalmia, where areas of still active, deep seated, tarsal trachoma were excised; and in the treatment of pterygium, in place of the Thiersch-flaps recommended by Hotz. My reason for preferring them to Thiersch-flaps, which I have also used extensively, in similar operations, is that skin, if it heals upon a mucous surface, remains skin without the slightest tendency to become mucoid in character. This I can positively assert after watching a number of cases for a number of years.* The result is that the epidermal cells, not being exposed to the same friction as on the surface of the body, accumulate on the grafts and probably, to some extent, decompose. This gives on close inspection an unpleasant appearance, in some cases, and where the area covered by the flaps is extensive, a constant though slight irritation of the conjunctiva generally ensued, unless the accumulations

*I have just seen a woman into the under surface of whose lids I put Thiersch flaps nearly seven years ago. They are just as much skin as ever; and nearly every week or so, she everts the lids and wipes the accumulated epidermis from off the flaps, to prevent a slight irritation of the cornea which otherwise occurs.

of epidermis are wiped off at regular intervals. When the Thiersch flaps rub on the cornea, there is also a slight mechanical irritation which though not important, in otherwise normal eyes, is decidedly detrimental in trachomatous eyes.†

Probably the main reason why these thin lip-flaps have not been used more generally, is that it is hard to get at the lining of the lips so as to use a razor easily; and to facilitate the process I have had a large clamp made of which the solid blade is smaller and set at an



angle with the shank so as to pass clear through the fenestrum of the other blade. Closing the blades upon the lip forces the latter into a tense prominence from which the membrane can easily be shaved.‡ The surface must of course be kept wet and the razor must be sharp. In cutting flaps to replace palpebral conjunctiva, it is better to cut them nearly twice as thick as where they are to be applied on the ball. They should be slid directly from the razor to the denuded surface and there trimmed if necessary. After pressing them down rather firmly with moist-tooth-pick swabs, they should be allowed to dry on, so to speak, for two to three minutes before the lids are allowed to close. A binocular bandage should be left on for the first twenty four hours and after that a monocular for four to five days. After a few days, a thin pellicle of epithelium is thrown off and what is left is so very thin and transparent that one is at first inclined to think that the whole flap has necrosed, but after some days it becomes evident that the flap is alive, although it is so much like the conjunctiva that its boundaries are hard to trace. As a rule, these flaps, after healing on, contract a little, but not much, more than Thiersch flaps, under similar circumstances. Occasionally though, for reasons which I do not understand the contraction is quite marked. Another slight disadvantage attaching to the use of the epithelial flaps arises from their extreme delicacy,

†Where a very small strip of skin is grafted on the eye ball, as in the operation for pterygium, most recently described by Hotz, the accumulations of secretions are generally so small as to cause no trouble and since even the thinnest lip flaps have a tint of pink the skin flaps are probably preferable where the surface to be covered is not large. However, for recurrent pterygium, however, quite large grafts are sometimes required and here the lip flaps can be used with advantage.

‡This clamp, made by Tiemann & Co., 111 Park Row, N. Y. U. S. A. is the best I have known for getting the long thick strips of lip sometimes necessary for the treatment of entropion.

this necessitates great care in handling them for if one lose track of the side which should go down, it is almost impossible to decide, by inspection, which it is; and it usually saves time to throw the flap away and cut a new one.

On Half-Skin Flaps.

By half-skin flaps, I mean skin flaps which, in point of thickness, are about half way between the Thiersch flaps and the Wolfe flaps, or whole-skin flaps without a pedicle. They should be cut with a razor used as in cutting Thiersch flaps, with the exception that instead of cutting off about as thin a layer of skin as possible one should make them about $\frac{1}{8}$ of an inch in thickness. Such a flap has, for the cure of severe ectropium or for replacing any extensive loss of the skin of either lid, a decided advantage over either the Thiersch flap or the whole-skin flap. When Thiersch flaps are used in these operations, the immediate results are apt to be excellent, but subsequently, particularly where it is the upper lid that is concerned, the effect is much reduced, on account of the Thiersch flap offering so little resistance to the contraction of the sub-cutaneous tissues. Where whole-skin flaps are used in such operations they heal on without difficulty, but while the lower layers are healing on, the upper layers, in my experience, always die, with much surface contraction as a final result. This contraction may sometimes be greatly reduced by the method which I suggested some years ago of scraping away the necrosed tissue and putting on a secondary Thiersch flap. But in doing this it is difficult to judge how much tissue to scrape away; so that while, in some cases, I have obtained excellent results by the process, in others the secondary Thiersch flap has failed to heal on, on account of an insufficient removal of the necrosed tissue. The half-skin flaps offer much greater resistance to sub-cutaneous contraction than the Thiersch flaps; and are not as subject to surface necrosis as a whole-skin flap. In the five operations in which I have hitherto used them a slight surface necrosis has occurred in two. In one of these, the necrosis involved so small a part of the surface of the flap that it did not affect the result; while in the other, in which nearly all the skin of one side of the face had to be removed for epithelioma, the secondary application of Thiersch flaps to two separate areas of necrosis succeeded perfectly.

I have no doubt that others have used these half-skin flaps but, so far as I know, they have not been specifically designated nor has their use been systematically urged.

A CASE OF STRABISMUS IN A PURE-BLOODED NEGRO

By **CHARLES W. KOLLOCK, M. D.**

President South Carolina Medical Assoc. Member Amer. Med. Assoc. and Amer. Ophth. Society.
Charleston, S. C.

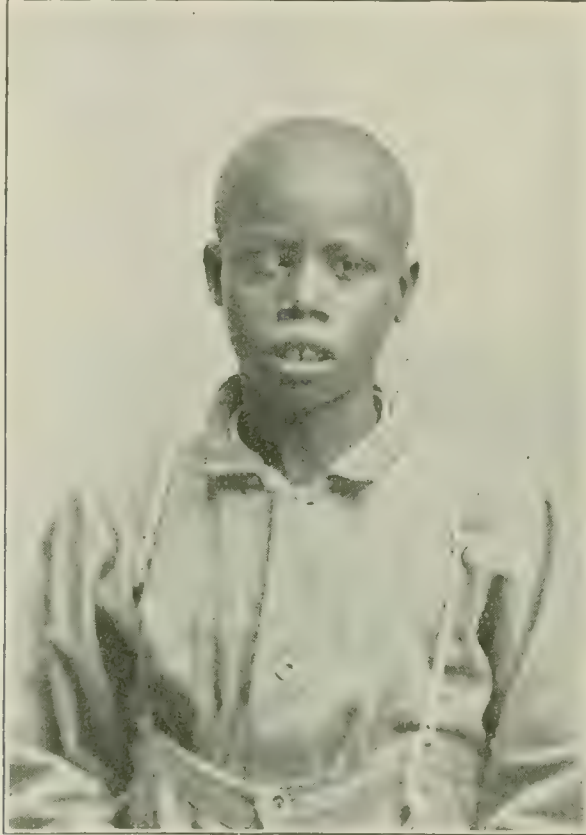
ILLUSTRATED

Some eight or ten years ago I was asked if I had ever seen a case of strabismus in a pure-blooded negro. I had never thought of it before and had no recollection of having seen such a case, but knew that it was not of infrequent occurrence in mulattoes. Since then I have examined the eyes of a great many pure blooded negroes but not until within the last month has such a case been seen. Of course one sees



many negroes who have crossed eyes or squints, which upon examination are usually found to be caused by one or more of the following conditions, viz. corneal leucomata, opaque lenses, diseases of the retina, choroid and optic nerve and paralysis of the ocular muscles. But a pure case of strabismus, such as occurs in hyperopic eyes, is a rare occurrence in the full-blooded negro.

My attention was recently called to a negro boy fourteen years of age in the ward of the Charleston City Hospital. He was under treatment for a slight injury of one leg. Examination showed an alternating squint as he could use one eye as readily as the other but never had binocular vision. The squinting eye turned in



so that the cornea was nearly hidden by the lids and caruncle. Atropine was instilled and by the test glasses, ophthalmoscopic and shadow tests he was found to have two dioptries of hyperopia. By the aid of the glasses vision in each eye became $\frac{2}{30}$, but the squint was not in the least altered by the lenses.

This case is unique in my experience as the eyes were without blemish, were not amblyopic and all the ocular muscles were strong. The accompanying photographs show the alternating squints very plainly.

THE INFLUENCE OF ANKYLOSTOMIASIS ON THE EYE.*

BY DR. A. NIEDEN.

Bochum, Germany.

Translated by Casey A. Wood, Chicago

Until a few decades ago the occurrence of the *Ankylostomum duodenale* was believed to be restricted to a few southern countries and to the tropics. Even Leukart in 1869 in his "*Handbuch der mensch-*

*Read before the Ophthalmological Section, International Medical Congress, at Moscow August, 1897.

lichen Parasitenlehre" remarks: "The parasite is probably never found on this side of the Alps." Modern investigation, however, has shown that the assertion, even at that time, was entirely incorrect. The actual presence of the ova of the parasite in the feces of living subjects was first demonstrated in the years 1877-78 by the Italians Grassi and Parona. Following these came the more extensive investigations of Perroncitto, explaining the actual cause of the so-called "tunnel anaemia" that affected the workmen employed in the underground borings of the St. Gotthard railroad.

Although it is true that in 1838 Dubini of Milan frequently found a parasite in the intestines of patients who had died of anaemia, and which Theodor von Siebold correctly diagnosed as belonging to the genus *strongylus*, it was not until the investigations of Bilharz in 1853 and Griesinger in 1854 that the parasite was recognized as the cause of "Egyptian Chlorosis." After the diagnosis had thus been placed on a firm basis, the various modifications of this form of anaemia, which up to that time had been attributed to manifold causes, were readily diagnosed, as reports from Brazil, Japan, the East Indies, Louisiana etc. from the end of the '60's will show. It was noticed in this connection, firstly, that people addicted to the peculiar habit of dirt-eating were easily attacked by this disease of the blood and, secondly, that workmen in brickyards, mines, tunnels and charcoal furnaces also readily fell victims to the parasite. This gave rise to the various synonyms, *Anaemia intertropicalis*, *oppilacas*, *latericia* or *montana*, *allotriophagia*, *maladie de terre* and *Tunnelanämie*. The discovery of the *Ankylostomum* in the intestines of miners in Sardinia, France (St. Etienne,) and Hungary (Kremnitz and Schemnitz) by Baccelli and Perroncitto furnished the clue to the etiology of all the cases of chlorosis among miners reported since the beginning of the century, the first of these occurring among workers in the mines of Valenciennes in France. This finding is further substantiated by the investigations of Masius, Francotte, van Beneden etc. in Belgium. It is very probable that the parasite was brought by Belgian miners to the Rhenish and Westphalian coal mines, and the recent studies of Leichtenstern, Löbker and Tenholt show that, to a greater or less extent, the entire population of these collieries, the largest in Germany, is afflicted with the disease.

In consequence of numerous opportunities for studying the nature of this disease in its various phases, and as examinations of organs remote from the initial seat of the malady became more frequent, it was

discovered that the eye often shows pathologic changes which must be regarded as entirely due to the parasitic disorder. Rampoldi (1887) and Fischer (Dortmund, 1892) first called attention to these complications, but on account of the small amount of material at their command they were unable to form any definite conclusions regarding their cause. Inasmuch as I have had occasion to examine several hundred cases, I take this opportunity of briefly recounting a few of the chief points of interest. I may say, to begin with, that the *Ankylostomum duodenale* is a nematode, belonging to the family of the strongylidae, (Dochmius) and that it derives its name from the fact that the body has a peculiar angular (*ἄγκυλος*) bend and that the duodenum was formerly looked upon as its habitat. The latter view has not been borne out by autopsies, the upper portion of the small intestines (jejunum) having been found to be the favorite resort of the parasite. The male worm is lighter in color, shorter (6-8 mm.) and narrower than the female, which is of a yellowish-brown color and 10-12 mm. in length. The head exhibits a wide mouth that opens into a capacious oral cavity. The latter is supplied with six tooth-like projections. The oral cavity communicates with the gradually widening oesophagus, which in turn terminates in the chylific intestine. The latter ends, in the female, in a cone-shaped tail, in the male in the cloaca, which contains the genital opening with its conical penis and two long spiculae. The spiculae hold the female during the act of coition. From the female genital opening a short vagina leads into an anterior and a posterior tubular cavity which contains the countless convolutions of the ovaries and tubes.

The ripe ova deposited in the human intestine are oval in form, 0.04—0.06 mm. long, 0.03 mm. wide and are, without exception, when discovered, found to be undergoing segmentation. The latter process does not continue, however, within the human intestine until the complete development of the embryo, on account of a lack of oxygen. For this latter purpose it is necessary that the ova find suitable surroundings (moisture and warmth) outside the body. In three days after leaving the intestine the embryo emerges from its capsule. The number of ova found in the human host is enormous. Leichtenstern found 19,000 in one gram of faeces. If we divide the number of ova found in one gram of faeces by 47, we obtain approximately the number of parasites that have found their way into the intestines. The proportion of males to females is as 1:3-6. The embryo becomes encapsulated at the end of four days in a transparent covering

and remains thus encysted until it is introduced into the human body. The cyst wall is then dissolved by the gastric juices and the liberated embryo enters the small intestine where it soon develops into a full grown worm. As such it now fulfills to the fullest extent the two purposes of its existence, viz: nourishing itself by sucking inordinate quantities of blood from its host and propagating its kind in the most extensive fashion. The ova may be discovered in the feces four to five weeks after the ingestion of the parasite, the life of the latter being from six to eight years.

The ankylostomum derives its nourishment from the plasma of the blood and does not assimilate the corpuscular elements, which pass through almost unchanged. It takes in much more food than it actually needs and for this reason Leichtenstern has properly given it the name of "*Lususparasit.*" The loss of blood to the host is often augmented by secondary hemorrhage from the bites. The direct result of this constant loss of blood, which is at times very great (frequently 3,000 worms are found in one intestine), is excessive anaemia of all the organs. The early symptoms are manifested in disturbances of the intestinal tract (especially loss of appetite and vomiting) and to these are soon added the sequelae of the increasing anaemia—weakness, dizziness, palpitation, dyspnoea etc. The face exhibits a yellowish tint, characteristic of the disease. The mucous membranes are waxy and the sclera has a peculiar glistening appearance. The blood is bright red while the corpuscles are pale and granular. Leucocytosis is found, especially in those cases where Charcot-Robin crystals are present in the feces. The haemoglobin is greatly diminished. The urine shows albumen in rare cases.

Unless proper and prompt treatment is carried out, or a spontaneous cure results, the ultimate outcome of the constant loss of blood is general marasmus and death.

As far as the special morbid changes in the eye are concerned, I have been able to demonstrate that from 7-8% of all patients show affections of the fundus oculi. My observations extend over 180 patients, all of whom had the characteristic symptoms of Ankylostomiasis.

No especial importance was attached to the appearance of the fundus due simply to the great anaemia—such as more or less pale color of all the capillary vessels, diminished calibre of the arteries and their occasional pulsation under normal intraocular pressure, a tortuous course of the veins, and often a porcelain-colored appearance of the papilla, such as is seen in the eye after death.

The hemorrhages in the fundus, similar to those already described by von Biermer in pernicious anaemia, are the most characteristic signs. According to my observations these occur more frequently and at an earlier stage of the disease in the peripheral parts of the retina than near the papilla or the macula. They are often in groups, dotted, and lie close together without being confluent. Occasionally, they precisely follow the course of the vessels and seem to be situated in the sheaths of the latter, thus forming striated hemorrhages which accompany the vessels almost to the papilla and frequently render their contour indistinct.

In addition to these signs we find in serious cases extensive hemorrhages into the retinal tissues. They are of the size of the papilla or even larger, and present irregular edges. I have seldom had occasion to notice the peculiar hemorrhages frequently found in leukaemia and scurvy, in which a whitish spot is found in the centre of the hemorrhage, indicating a beginning resorption. On the other hand, I could usually distinguish the regularly occurring fatty degeneration of the bloodspot, which showed the well known typical picture. I have never seen the stellate appearance of the macular region characteristic of retinitis albuminurica. As already mentioned above, the urine contained albumen only in very rare cases.

Postmortem examinations reveal the peculiar changes in the fundus with even greater distinctness than does the ophthalmoscope, the bright red blood-spots being very conspicuous in the pale yellow background of the retina. The microscope shows sclerotic and fatty degeneration of the intima of the blood-vessels. The same condition is found in the endocardium and larger vessels, and in the mucous membranes and other tissues of the various organs of the body similar hemorrhages are detected. These phenomena are analogous to those described in 1894 by Natanson and in 1895 by 'Tschermolow in four typical cases of pernicious anaemia caused by *Bothriocephalus latus*. In these cases the blood extravasations were grouped about the papilla and the macula and had also caused aneurysmal herniae as a result of rupture of the adventitial sheath of the vessels.

The disturbances of vision are caused not so much by these retinal changes as by the constitutional condition. When, however, the extravasations occur in the region of the macula a scotoma is likely to result. In most cases in which I could detect extensive alterations in the fundus the patient had no intimation of the pathologic condition of the eye.

Accommodative weaknesses, inability to use the eyes any length of time and other forms of asthenopia are, on the other hand, readily noticed. Slight, intermittent paresis of the extrinsic and internal eye-muscles, with double vision and vertigo, is likewise a not infrequent occurrence, and where predisposing conditions, such as working in collieries are present, nystagmus is a common complication.

Furthermore, we observe a retinal weakness in consequence of the anaemia and malnutrition, evidenced by photophobia and hemeralopia, a condition often found in this part of the country during the Easter fast-days. In these cases we notice a slight concentric contraction of the field of vision, especially after a long-continued examination of the eyes. Emigration of the parasite into other organs has not been so far demonstrated, because favorable conditions for further development are present in the intestines only. The parasite cannot possibly occur, therefore, as an entozoon in the eye.

It is still a moot question what gives rise to the peculiar changes in the fundus, such as we notice in this disease and in pernicious anaemia. It is doubtful whether the great loss of blood and the constant drain from the intestinal tract can alone account for them, especially when we remember that in similar acute and chronic hemorrhages from other causes no such retinal alterations occur. Even in excessive anaemia and chlorosis we do not find analogous degenerations. It is very probable that one must look for the causative factor in the toxic products introduced into the body by the parasite. In like manner we must explain the fatty degeneration of the retinal fibres, with or without hemorrhages, that is observed in the cachexia of cancer. Whether these toxins, as Fischer believes, are contained in the Charcot-Robin crystals, future investigations must decide. It is a fact that these crystals are found most abundantly in those sections of intestine that contain the largest number of worms. If the above theory be correct we may also assume that the toxins destroy the red corpuscles and are responsible for the formation of eosinophile cells (according to Leichtenstern, as high as 60%) which in turn give rise to blood extravasations.

As for the therapy I may state that the disease is fortunately readily amenable to treatment in all cases in which the anaemia or cachexia has not become too marked or has not lasted too long. A positive cure can be brought about by the administration of 10 grams of *Extract. filicis maris recente paratum*.

It is interesting to note that during the process of expulsion of

the worms, the males are expelled sooner and in greater numbers than the females. This may possibly be explained by the fact that the males change their location more frequently (for purposes of copulation) while the female is more likely to remain fixed to the intestinal wall.

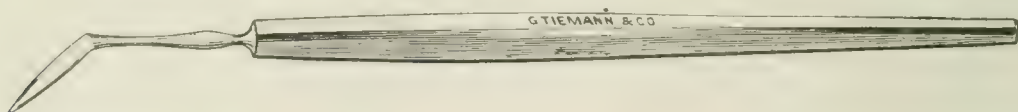
It is, finally, important from the standpoint of diagnosis to note that the ophthalmoscope demonstrates positively the differences between changes occurring in chlorosis and simple anaemia and those brought about by the so-called pernicious anaemia dependant upon the presence of infectious parasites.

THE SIMPLE EXCISION OPERATION FOR PTERYGIUM, WITH A NEW INSTRUMENT.*

By G. MELVILLE BLACK, M. D.

Prof. Ophthalmology and Otology, Gross Medical Coll.
DENVER.

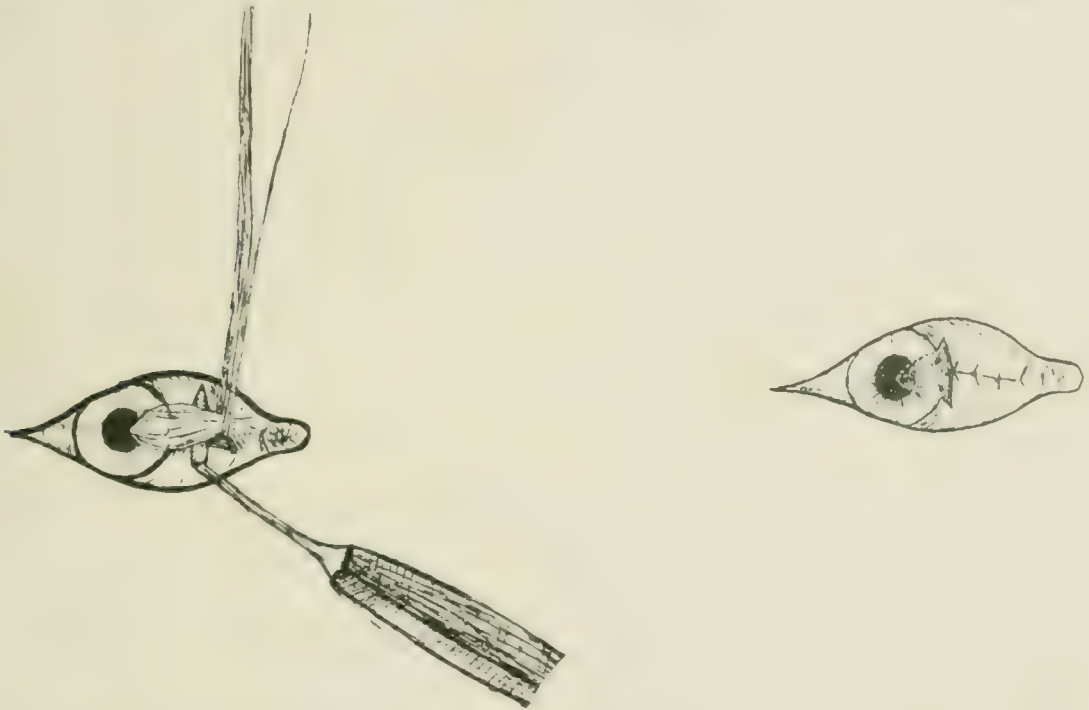
This little instrument that I present I am informed was used in the Wills' Eye Hospital, Philadelphia, some years ago as an iridectomy knife. My attention was first called to it by Dr. Wm. C. Bane of this city who had one in his possession. As soon as I saw it, it occurred to me that it would be a handy instrument to use in the removal of pterygia. In looking over Tiemann's catalogue I found an instrument listed as Agnew's Iridectomy Knife, which was nearly this shape, only it was about three times as large. I sent to Tiemann & Co. and had them make for me the instrument you see before you.



I operate, by simple excision, with this knife in the following manner. Having cocainized the eye the pterygium is seized at about its middle with a delicate pair of mouse-toothed forceps and lifted up and away from its underlying attachments. The point of this little knife is then passed from above downward or from below upward underneath the pterygium just a little to the corneal side of the forceps. Then with the side edge of the blade the pterygium is severed up to its corneal attachment. The head of the growth is removed from the cornea by prying it loose with the edge of the knife and by some cutting. The knife or scissors can be used to complete the excision of the pterygium from its base by continuing the incisions above and below toward the caruncle until they meet at the latter. If the cornea, where the growth was attached, is not clean it can be scraped with the edge of

*Read before the Denver and Arapahoe Medical Soc. Oct. 12th-'97.

the knife. The elliptical opening which is left in the conjunctiva is to be closed with from two to three sutures. Before introducing the sutures I dissect up the conjunctiva above and below so that it will meet without too much tension. To prevent the over-riding of the conjunctiva on the cornea, where it is raw from the removal of the head of the pterygium, and where the conjunctiva would be liable to become adherent, I make two little cuts above and below in the conjunctiva running from the corneal margin supra-nasally and infra-nasally. If the first suture is placed in the conjunctival points formed by these



two cuts there will be a little bare spot, after the suture is tied, lying between the margin of the cornea and the conjunctiva. This is desirable because otherwise the over-riding of the conjunctiva on the raw cornea is liable to result in attachment of the former to the latter with resulting nonsuccess from the operation.

I have always performed the simple excision operation for pterygium. So far it has never failed me. Where there has been a tendency to recurrence I have always been able to check it by cauterizing the apex of the growth with the actual cautery.

I am very much pleased at having discovered this knife. It renders the operation very much easier of performance, almost bloodless, entirely painless and its performance, attended with scarcely any traumatism to the eye.

A BRIEF REPORT OF TWO CASES.

By W. S. SIMS, M. D.

A member of the Mississippi State Medical Association.

Meridian, Mississippi.

Case 1st.—July 1896 Mr. G. age 72 years, applied to me for an operation for cataract. After making the incision there was a partial protrusion of the iris and according to my usual custom, when this happens, I proceeded to do an iridectomy. After I had taken hold of the iris with the forceps and was about to withdraw it a slight twitching of the muscles of the face was noticed. Thinking it was the result of a slight pain, that sometimes accompanies this part of the operation I held on to the iris and was just going to say "keep quiet" when he suddenly sneezed. In his effort to suppress the sneeze and my short notice of what was going to happen, I failed to turn loose and to my great astonishment I found I had removed the entire iris.

The anterior chamber was instantly filled with blood and continued to refill regardless of all efforts to control it which forced me to complete the operation with all view of the lens obstructed by the hemorrhage. The usual antiseptic dressings were applied and a very guarded prognosis given but contrary to all hopes of a successful termination of the case, the eye recovered without a bad symptom, and the blood was slowly absorbed, so much so that in about six weeks he was able to count fingers. Two weeks later, with the aid of glasses, he was able to read small type.

There is now a ring like deposit, I suppose to be lymph, around the central opening. The sneeze was accounted for by removing his shoes while on the table placed near an open window, for the operation.

Case 2nd.—Miss H. age 35 consulted me March 10th, of this year for an examination of her eye. She gave a history of a slight nodular elevation* that appeared upon the outer and upper lid border of the right eye about six years ago. It attracted but little attention until about one year later, when a physician was consulted, who prescribed an ointment that seemed to afford relief for a time only, when it reappeared. This time the ointment failed to give the desired result. Another physician was consulted who removed a portion of the lid by an operation which effected, as she thought, a permanent cure, but returned as before within a few months. She next consulted a "Cancer Doctor," who treated her with caustics. This was attended with intense pain and followed by a more rapid progress of the affection.

At the time I saw her a greater part of the upper lid was destroyed and the lower lid and ball were also invaded, I explained to her the malignant nature of the trouble and rather discouraged an operation. But she urged me to do something to relieve her present sufferings and with a perfect understanding as to results that might follow I did March 11th, with the aid of Drs Blanks and Gulley of this city, the following operation: I first removed the ball which was found to be intensely hard. I then made a curved incision beginning at the inner angle, extending it to about one fourth of an inch beyond the outer angle including everything, even the lachrymal gland, up to the lower edge of the brow.

A similar incision was made, except that only about half as much tissue was

*No microscopic examination was made

included to remove the lower lid. These incisions were extended very deeply, including the conjunctiva and almost the entire contents of the orbital cavity. The edges of the wound were now brought together with deeply inserted sutures. The healing was perfect and a more beautiful result I have never witnessed. The brow at first drawn down, has at this writing resumed its natural position and the slight depression in the orbit gives to the patient not an unsightly appearance.

I am in receipt of a letter dated April 14th, 1897 from Dr. W. W. Hamilton of Brooksville, Miss., whose care she is now under and who writes me as follows: "I think the operation a beautiful success. The closing of the orbital cavity in toto seems rather novel, but I think it far preferable to leaving it open in this case and if you succeeded in removing all diseased structures the trouble will be less likely to return than if the wound had been left open."

The only excuse I have to offer for reporting the two above cases is the very unusual accident in the first case and the very remarkable circumstances under which it happened. It is also interesting to note the favorable termination of the case.

The point of interest in the second case, to me, is the closing up of the orbital cavity, as I have never seen it performed, and so far as I have examined the literature on the subject, I am unable to find a description of the above method.

A NEW EPILATORY NEEDLE.

By A. J. ERWIN, M. D.

Mansfield, Ohio

The usual failure of the single probe epilatory needle, to sufficiently cauterize the follicle, to prevent the reproduction of hair, has demonstrated the need of a better cautery for that purpose, and having failed to find a bipolar needle electrode fine enough to enter the follicle, I have had one made by Geo. Tiemann & Co., of which the following is a full size cut, it has a single point—instead of the usual



double one—projecting 5 m. m. beyond the junction of the platinum by which it is heated, it is made short so that the hand can rest upon the part and better direct it. I introduce the needle to the bottom of the follicle before closing the circuit, the operation must be closely watched, and the needle withdrawn as soon as the effect is sufficient. I use it with my cautery battery very satisfactorily, especially in partial trichiasis and distichiasis.

CORRESPONDENCE.

Buffalo, N. Y., Oct. 23, 1897.

EDITOR OF THE OPHTHALMIC RECORD.

My dear Sir,

My attention has been called to the editorial in the September Number concerning ophthalmia neonatorum. In this are quoted the resolutions which were adopted by the Ophthalmological Section of the American Medical Association apparently criticising them sharply because they did not advocate the universal use of the Credé method. It is said in italics that Credé's method now "should be applied by every person officiating at the parturient bed-side, and that it should be done to the eyes of every living infant at the time of birth as universally as is the ligature applied to the umbilical cord or the first bath to the body."

This is all very well from the standpoint of the doctrinaire. Unfortunately, however, there are too many who do not agree with this. When a resolution similar to that referred to, was presented at the American Ophthalmological Society it could not be passed at once but was referred to a committee for further consideration. If such conservatism can be found in that society, it is not surprising to see a large number of general practitioners ready to oppose any "compulsory medication" with all the strength of organized ignorance. The gist of the matter is that whatever ophthalmologists may think of the necessity of Credé's method it is probably unconstitutional and practically impossible at present to enforce it in private practice. But on the other hand the state, like any individual, has the right to dictate how those under its care shall be treated—and if the method can be made compulsory for public institutions, the good effects there will show that it is malpractice to omit it elsewhere. That seems the best way to teach the profession, as well as the laity.

Very truly yours,

LUCIEN HOWE, M. D.

Ithaca, N. Y., Oct. 30, 1897.

TO THE EDITOR OF THE OPHTHALMIC RECORD.

Dear Sir:

In the August No. of your Journal on page 441, Dr. Melville Black of Denver, Colorado, casually writes. "I am inclined to think

that too many of us are afraid of strong solutions of nitrate of silver, whereas if the reverse were true, and solutions of silver from forty to eighty grains to the ounce were used as above described early in gonorrhoeal ophthalmia we should not have occasion to look further for another abortive agent."

I thoroughly concur with Dr. Black in this belief except that I know from my experience with the last seven cases, since 1894. Prior to that time, I used the weaker solutions combined with cleansing with antiseptic solutions, antiseptic salve and iced cloths also atropia or eserine as indicated, as described in the text books at my command, and in almost every case I lost one eye almost entirely, with its fellow badly damaged with a leucoma. The above results are perhaps painted blacker than they really were, but suffice it to say I became disgusted and resolved that in succeeding cases I would try stronger solutions which I did and was very much pleased with the result. With both infants and adults I now use at the onset a sixty grain solution carefully applied to the everted lids allowing the caustic effect of the drug to become well established before using the saline solution, then using the other treatment described in the text books as indicated. I have now treated seven cases in all by this method and in most of them I have not been obliged to repeat the seemingly savage dose, the duration of treatment has been very much shortened and constantly under complete control, and in not a single one have I lost an eye or had the slightest corneal disturbance. In all there were no after effects to the lids. I believe it to be our only abortive remedy.

Yours truly,

JOHN S. KIRKENDALL, M. D.



REVIEWS

In the *Medical News* of May 8th, Charles Stedman Bull, M. D., of New York has a interesting paper on "**Lesions of the Retinal Vessels, Retina and Optic Nerve, Associated with Gout.**" Speaking of gouty retinitis and forms of neuroretinitis due to the pathologic condition of the blood in gout, he calls attention to a strong resemblance to certain types of syphilitic retinitis, "and which may or may not be accompanied by retinal hemorrhages and opacities of the vitreous humor."

The retinal hemorrhages of gout he attributes to the general well known "venous obstruction, and irregularities of the circulation—great arterial pressure and relaxed condition of the vascular walls.

He enumerates the effects of the poison of gout on the vascular system, as: (1) a high blood pressure in the arteries. (2) hypertrophy of the left ventricle; (3) hard, incompressible arteries undergoing atheromatous degeneration."

He speaks interestingly of Thoma's investigations along the line of inherited tendencies of certain gouty families to arterial degeneration and then immediately says: "We now recognize the fact arteriosclerosis is caused by some general disturbance of nutrition, which is partly the result of infection, intoxication and other pathologic lesions as yet but little understood, and partly the accompaniment of senile changes." However his discussion of the changes produced in the blood and resultant obstruction of circulation in the capillary system, which in turn directly changes not only the blood current but the coats of the vascular system as well, deserves more than passing notice.

"Whenever the current is slow, the middle coat of the artery usually contracts, and when this does not occur, a new growth of connective tissue is developed in the tunica intima, which thus reduces the arterial calibre. The muscular coat of the artery first becomes involved, and the loss of elasticity permits the artery to dilate. As a result the blood currents becomes slow, the vasa vasorum are distended, and a new growth appears in the intima, and is followed by the same process in other coats. A similar condition is met with in the veins, and in fact, the phlebosclerosis or endophlebitis may precede the endarteritis sometimes by a lengthy period."

After briefly reviewing the statements of Gauté, Lychon, Hutchinson, Gowers, Galezowski and Wagemann, Dr. Bull draws the fol-

lowing conclusions relative to changes produced in the walls of the blood vessels of the retina, choroid, optic nerve etc. etc:

"(1) The changes in the fundus are always bilateral, though rarely symmetrical in the two eyes. The lesions may begin simultaneously in the two eyes, but this is by no means always the case. (2) The degenerative changes in the walls of the blood vessels, both arteries and veins, are at first very minute, and are often overlooked. They must be carefully searched for, as they begin in the intima. (3) The general angiosclerosis, and the patchy exudation in the retina, cause marked impairment of central vision, but little impairment of the peripheral vision, and the disease never ends in blindness. (4) The loss of central vision is always progressive up to a certain point. Improvement of the vision, after the retinal disease is established, cannot be expected, though in favorable cases the existing vision may be maintained. (5) Hemorrhages into the retina are rare except in the comparatively early stages of the disease. When the vessels lose their elasticity by reason of the increase in the thickness of their walls, due to the deposits, the vessels become stronger and more rigid, and hemorrhages are no longer to be feared. (6) The most marked feature in the ophthalmoscopic picture is the development of the angiosclerosis in the vessels of the retina. This condition is confirmed by the microscope, and is seen to extend to the vessels of the optic nerve and choroid. (7) Another almost equally marked symptom is the peculiar yellowish granular exudation in the retina, located by the ophthalmoscope around the posterior pole of the eye, and generally leaving the macula intact until late in the course of the disease. This exudation is shown by the microscope to be mainly in the nerve-fibre layer, though found in all the layers except that of the rods and cones. (8) The changes in the optic nerve-fibres seem to be generally intra-ocular, but have been traced occasionally for some distance back of the eyeball." The rare opportunity of making several postmortem examinations, after having observed the pathologic changes in the retinal vessels, retina and optic nerve in life, has aided the author in arriving at fixed conclusions, which are both very interesting and instructive.

A. W. CALHOUN.

REPORTS OF SOCIETIES.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

Regular meeting was held November 9th, 1897, Dr. Montgomery in the chair.

Dr. Norval H. Pierce opened the discussion on Chronic Suppurative Otitis Media as follows: He said that a proper comprehension of the factors involved in the treatment of chronic suppuration in the middle ear may best be arrived at by briefly considering; (1) the pathologic processes which induce suppuration in the tympanic cavity, comprising the microorganisms involved; (2) routes of invasion, and (3) the conditions which prevent their escape, or destruction. These three points were discussed seriatim.

In considering the treatment, he had come to believe from experience that many cases of catarrhal inflammation assume a suppurative or chronic form because of ill advised treatment. One of the most prevalent errors in this regard is the empirical and illogical use of ear drops, douches and inflations. The author showed that this was bad treatment. The first condition to be met in chronic, as well as acute otitis media, whether suppurative or catarrhal in form, is drainage. There is no other factor which tends to perpetuate a suppurative ear disease so frequently as lack of drainage or retention of discharge. At his clinics he rarely uses injections. The ears are cleansed by carefully swabbing away secretion by means of sterilized cotton pledgets. These pledgets are kept constantly on hand. The external auditory canal is then packed with a strip of sterilized gauze, care being taken that it barely touches the membrane.

With reference to douching, Dr. Pierce said there are a few cases which demand irrigation, and in these the ear is cleansed through the Eustachian tube whenever possible. When the affection is bilateral he uses Gruber's method. A syringe with a blunt point, holding two ounces, is introduced into the nostril. The other nostril is closed by the thumb as in Politzerization. The patient is told to blow out the cheeks forcibly when the contents of the syringe are forcibly ejected. In this way the solution, by way of the Eustachian tubes, enters the middle ear, and then through the perforations in the tympanum finds exit into the external auditory canal.

Surgical Treatment. When the discharge continues after a months treatment by the method described, the author resorts to operative interference, providing there is no indication of polypoid formation or caries. In the case of a polypus being present he snares it away immediately, or in the case of opposition to surgical interference on the part of the patient, he reduces it by means of sesqui-chloride of iron or alcohol. In his hand syringing of the attic by means of Hartmann's canula has proven unsatisfactory in almost all cases.

Dr. Pierce then touched upon a few practical points that had been impressed upon him through his own experience in the surgical treatment of otitis media suppurativa. As regards narcosis, a general anesthetic should always be used in those cases where any considerable amount of the membrane remains, for the pain is usually intense during the operation, and hemorrhage from the granulations is very likely to delay manipulation. Cocaine may be relied upon in those cases where the tympanic membrane is largely destroyed and where granulation tissue is nearly altogether absent. The attic can be best cleaned by the attic scoop. The after-treatment should be the same as that pursued before operation, namely, packing with gauze drains. He had seen numerous cases that have run along for twelve years or more in which suppuration ceased in two months after the operation.

Dr. Dickerman referred to the varying susceptibility of different patients to middle ear disease and gave great importance to the condition of the nasal pharynx in these cases. He had found that in cases where the Eustachian tube was blocked by nasal growths, that ear disease was far more common. Regarding treatment, he agreed with Dr. Pierce that the dry method was by far the best and he believed that acute cases would never become chronic if properly treated. The bone in which necrosis most often takes place, is the incus because the blood supply is entirely from one small artery which is easily occluded, any slight pressure from swelling being sufficient. In these cases of necrosis a thorough curetting is absolutely essential and due care must be taken of the facial nerve which is easily injured by instruments or escharotics. He had found that the improvement in hearing in most of the cases was marked.

Dr. Henry Gradle: A fair experience has shown me that the gauze drainage advocated by Dr. Pierce is the speediest treatment at present known in acute inflammation of the middle ear. But, I have never used it as yet in the chronic form. In discussing the treatment

of chronic suppuration of the middle ear, I wish to emphasize certain principles which I fear are not yet appreciated by all practitioners. In general surgery it is well known that the tissues will invariably recover from pyogenic infection if the pus can escape freely, and there are no unfavorable conditions present, as for instance, foreign bodies. The same is true of inflammation of the middle ear. For anatomical reasons there is, however, much liability to the damming up of the pus with consequent persistence of suppuration. The reasons are partly the obliquity of the meatus, partly the complex architecture of the tympanic cavity, the liability to the formation of occluded crevices, by swelling of the mucous membrane or granulation tissue, and particularly the partial occlusion of the attic by adhesions and newly formed bands of tissue. All these conditions interfere with free drainage of the pus, and thereby favor secondary infection with putrefactive bacteria from the meatus. Inspissated pus, moreover, acts as a foreign body, and thus maintains continued suppuration.

A valuable sign of retention of pus in the cavities of the middle ear is its odor. Freely escaping pus has no fetid smell, while a foul odor indicates imperfect drainage. We can make use of this important criterion to test the efficacy of treatment. On the basis of continued study of such cases I can state emphatically that any treatment which does not remove the odor will never lead to a cure of chronic purulent otitis, and that conversely, whenever the odor has been removed the tendency to recovery can be at once observed. A small number of cases may not entirely heal under the treatment which removes the odor, but this is a rare exception. On the other hand, the first principle stated has no exception whatsoever.

My treatment always begins with the free use of the syringe. A fine nozzle protected by a bit of soft rubber tube must be carried far into the meatus. Thorough syringing alone cures many cases. I can say this on the basis of some cures accomplished by syringing followed by the experimental use of various powders like iodoform, which I have since learned to be absolutely inert. But syringing will not cure all cases, nor is it the speediest form of treatment when employed alone. All uncomplicated cases of marked purulent otitis will heal under the use of boric acid lightly insufflated. In a small percentage of instances a single insufflation has resulted in a permanent cure. If the cure is delayed there are complicating conditions present which we must inquire into, and which can not be better treated by the use of the various substitutes recommended for boric acid at various times.

What we wish to accomplish by insufflation is to put into the ear a deposit of a non-irritating antiseptic which checks bacterial activity on the surface of the tissues. Boric acid answers these requirements so fully that I can see no reason for any search for substitutes for it. The addition of any antiseptic fluid to the water used for syringing appears unnecessary to any one familiar with surgical pathology, and many trials in former years have convinced me of the utter uselessness of all fluid antiseptics (including peroxide of hydrogen).

Insufflation through the Eustachian tube I formerly used as a routine method, but I have failed to see the least delay from its omission.

If these measures do not remove the odor after one or two treatments, other means must be adopted. Irrigations through the Eustachian canal has not proved of any use in my hands for the purpose of removing pent up secretion or inspissated pus. I have learned to regard, however, as very valuable, irrigation of the tympanic cavity and attic through the intra-tympanic canula. Hartman's rubber tube is too thick. I use a silver tube, closed at the end, but with lateral eye, attached to a (ten gram) piston syringe. Its efficacy is shown in suitable cases by the appearance of numerous pus collections in the basin, and the disappearance of the odor. It is often painful to the patient, but I have never seen any harm done by its use. Intolerance of the patient may require a repetition of its use at different sittings until all odor is removed.

In some instances, in which no complicating lesions existed, but where the intratympanic canula failed to dislodge the retained pus, I have made use of fluids capable of penetrating better into the small crevices than water on account of their lower surface tension. I use first a solution of salicylic acid in alcohol and ether, and follow this by carbolic acid in glycerin, one in ten. A number of times my reasons for the employment of the solutions were justified by the subsequent disappearance of the odor and the progress of the case. I have also made attempts to dissolve carious bone by baths of hydrochloric acid (five per cent.), and to digest obstructing granulation tissue by acid pepsin solutions, but am not convinced that I have ever accomplished anything thereby. If these modes of treatment fail to remove the odor, we must attack surgically those conditions which interfere. Polypi must be removed, although small ones may sometimes disappear by absorption under such treatment without delaying the cure. Visible granulation tissue is to be curetted. Carious bone must be cleansed by the curetting of adherent fragments of tissue: but when

cleaned it does not interfere with recovery as I have learned repeatedly. Small openings in the membrana tympani, or in Shrapnell's membrane, may be enlarged, although I have but rarely seen any benefit from this procedure. When persistence of the odor indicates the inefficiency of the treatment, I attempt to clear out with the snare and curette the entire intratympanic cavity, removing as much as possible of the ossicles, so as to expose the attic freely. I have, however, not concluded to do a simple Stacke operation for the reason that Stacke himself found that in most cases requiring his operation, the mastoid is involved. Whenever, therefore, I find that I can accomplish nothing by the minor surgical measure I perform the Zaufal operation, and convert the antrum, tympanic cavity, attic and meatus into one cavity.*

As a rule, otorrhoea diminishes steadily until cured, after the odor has been removed. There are, however, a few rare cases where many months may be required for this result. Generally, the treatment will not extend over a longer period than four to six weeks at most. There are some cases in which no odor is present when first seen and which still proves very rebellious to treatment. They are characterized by a very profuse, stringy, muco-purulent secretion which presumably comes from the mastoid antrum.

In those instances of this kind in which there are no indications for naso-pharyngeal treatment I have often found it possible to influence the secretion very markedly by the use of tannin dissolved in glycerin (one in four), retained in the ear for hours. Repeated trials have shown me the efficacy of this treatment under these conditions, but it is not infallible. Some of these cases with profuse, stringy secretion occur in children with a similar profuse chronic purulent rhinitis. This disease has been described by Bosworth as a special type occurring in children, and I can confirm his description fully, but must differ radically from him regarding its ultimate outcome. He considers it the first stage of ozena. I cannot admit this at all as I have watched some of these children for months, partly after efficacious treatment, partly after treatment insufficient on account of frequent interruptions. Moreover, the few cases of ozena which I and others have been able to catch in their incipency began in an entirely different manner. This chronic purulent rhinitis of children can be

*Of all complications the most important is the existence of cholesteatoma. If, with this condition, the odor cannot be removed a radical operation is required. If the deodorization can be accomplished the cases generally heal, and may stay cured for months or years, but relapses rarely fail to set in.

cured by the persistent use of the nasal douche kept up for many months. The same treatment, extended into the Eustachian tube, will also cure the corresponding form of middle ear disease. When both ears are involved it is easy to use the Politzer bag, filled with saline solution, instead of air. When the disease is one-sided the more cumbersome Eustachian catheter must be employed. With such irrigation boric acid insufflations must be combined.

It may not be amiss to add that hypertrophy of the pharyngeal tonsil is not only a frequent cause of inflammation of the middle ear, but accounts also for many relapses observed in childhood, and that in every case of chronic otitic suppuration we must attempt to maintain a normal condition of the nose and pharynx.

Dr. Tilley is a firm believer in syringing in these cases and thought it of more value than the dry method of treatment. He uses a bulb syringe similar to the one used by dentists and injects the fluid into the tympanic cavity. He finds a solution of carbonate of soda most valuable. He considers constitutional measures of the greatest importance and uses the solid iodide of iron and cod-liver oil in nearly all his cases. The nasal condition is also carefully looked after.

Dr. Wheelock agreed with Dr. Gradle that the odor of the discharge is a good index to the conditions of the ear. He syringes most of his cases with peroxide of hydrogen allowing it to remain in the ear for some minutes. Where granulations are present he finds that they can be most comfortably removed with absolute alcohol. He has been recently trying a one-half per cent. solution of formalin instead of the peroxide and finds it very satisfactory. It seems to have a more penetrating effect than any other solution. Patients are instructed to syringe the ear at home with two quarts at least of hot water by means of a fountain syringe held a few inches above the level of the head.

Dr. Colburn uses peroxide quite frequently, but called attention to the dangers of using it in cases with perforation because of the pressure exerted by the gas in the middle ear.

Dr. Coleman also uses peroxide freely. For some time he has been using the Politzer method of inflation in combination with cleansing the ear and considers it very satisfactory. He does not think there is any danger of reinfecting the ear from such treatment. When granulations are present he destroys them with chromic acid.

C. P. PINCKARD.

Secretary.

SECTION ON OPHTHALMOLOGY.

College of Physicians of Philadelphia.

Meeting, October 19, 1897. Dr. George C. Harlan in the chair.

Dr. G. E. de Schweinitz read a paper on *Amblyopia in Horses*, probably due to the toxic influence of tobacco, as described by Dr. James W. Barrett, of Melbourne, Australia. Through the courtesy of Dr. Barrett he was enabled to exhibit to the Section two slides which Dr. Barrett had prepared from the optic nerves of a horse which had become blind, owing, it was supposed, to the consumption of some plant, probably the Australian tobacco plant. One of these sections, originally stained with carmine, had been removed by Dr. de Schweinitz from the slide and re-stained by the Weigert method. The section was composed of about one hundred nerve bundles, some of which showed distinct signs of disease, namely, a species of fibrosis which separated, pressed upon, and destroyed the individual nerve fibers. This was a marked phenomenon in several of the bundles and less apparent in others. The Weigert section confirmed, in large measure, the observations already made by Dr. Barrett, who also found atrophy of the nerve fibers, but who did not describe abnormal development of connective tissue. It appeared exactly to coincide with the observations of Dr. Tidswell, who described the condition as one of progressing fibrosis with some degeneration of the nerve fibers.

Dr. de Schweinitz also read a paper on *Blood-vessel Formation in the Vitreous*. He described the ophthalmoscopic appearances of the left eye of a man, aged 26, as follows: The optic disk was a vertical oval, of somewhat pallid color, and springing from it there was a greenish-white mass of the type usually seen in proliferating retinitis, which carried a veil of anastomosing blood-vessels and terminated in several clump-like, dark bodies, one extending forward into the vitreous 7 D. Similar patches of greenish-white connective tissue, supporting similar congeries of blood-vessels, were visible above the disk, above the macula, downward and inward along the course of the inferior nasal vessels, and directly below the disk. These masses varied in prominence in the vitreous from 3 to 7 D. The patch above the disk was in immediate connection with an area of retino-choroiditis, and some of the blood-vessels could be traced directly to this patch. No direct communication with the fundus could be seen in the other masses. The patient's vision was normal and, in general, the vitreous clear. The only probable etiological factor which could be discovered was an uncertain history of syphilis, although a careful examination

by his family physician had failed to reveal secondary symptoms involving skin or mucous membrane. The treatment had consisted of a thorough course of mercurials and iodid of potassium, which, however, had produced no visible effect upon the retinal lesions.

Dr. de Schweinitz described the various theories which had been advanced to account for the development of connective tissue in the vitreous, associated with the formation of blood-vessels, and thought that the one which ascribed them to the result of hemorrhages was the one that had most to commend it.

Discussion.—Dr. G. C. Harlan showed the picture of a case of extensive vascular growth in the vitreous, reported at the meeting of the American Ophthalmological Society in 1889. A beautiful vascular network forming a delicate membrane extended into the vitreous from the disk where the larger vessels arose. These vessels subdivided rapidly and ended in capillary loops best seen with + 4 D. The vitreous was clear within the meshes of the membrane, which nearly disappeared from view when the fundus was focused. There were repeated retinal and vitreous hemorrhages. Two years later most of the smaller vessels had disappeared, and many of those remaining were empty.

Dr. Harlan also referred to a case of repeated hemorrhage, from which Dr. Theobald, of Baltimore, had the opportunity of watching the growth of a somewhat similar vascular membrane.

Dr. P. N. K. Schwenk spoke of a case in which a similar vascular tumor had grown from the optic disk. Small hemorrhages were detected in its periphery.

Dr. Edward Jackson referred to a case previously shown before the Section, in which repeated hemorrhages through some months had each been followed by an outgrowth of vessels into the vitreous in the region of the hemorrhages.

Dr. B. A. Randall had seen a case of similar fibrous development from the disk without vessels.

Dr. S. D. Risley reported a *Case of Ocular Disturbances from Injuries to the Head*. He made a preliminary report in a case of blindness in the left eye, with marked swelling of the optic nerve, a recent hemorrhage at the macula, floating vitreous opacities, and an extensive detachment, probably of both choroid and retina, throughout a large portion of the lower half of the eye ground. There were, also, in the upper temporal quadrant of the fundus, radiating gray-white streaks, one of which resembled the late appearance after rupture of the cho-

roid, and others appeared to be folds of detached retina. The changes had followed a blow received one year before with a baseball bat on the left side of the head, anterior to the ear. There was no sign to indicate the exact location of the impact. He was rendered unconscious by the injury, and remained under treatment for three weeks. He now has frequent convulsive attacks affecting the right side, which begin in the toes of the right foot, rapidly ascend the leg to the right arm, ending with twitching of the left side of the face and severe occipital pain. This case forms the last of a series of five cases that had come under Dr. Risley's notice, in which blindness in one eye had followed blows or injuries to the anterior portion of the skull. Case I was that of a young child who had fallen, striking the left infra-orbital ridge. In three weeks atrophy of the left optic nerve had commenced, which became complete with total blindness in the left eye. There were no hemorrhages or other ocular changes. Case II was that of an elderly man who had commencing atrophy of the optic nerve with whitish splotches and gray infiltration in and around the macular region, following a severe blow on the outer angle of the left supra-orbital ridge. The atrophy became complete. There were no hemorrhages in the eye-ground and no detachment of the retina. Case III was that of a man who was struck by a falling timber on the anterior part of the top of the head, which felled him. A short time after he complained of failing vision in the right eye. There were fine granular changes with slight gray infiltration in the macular region and incipient atrophy of the optic nerve with some contraction of the visual field. Both the contraction of the field and the atrophy progressed for some weeks and then became stationary, resulting in a marked and permanent impairment of vision but not in total blindness. Case IV was that of a farmer who was struck in the left temporal fossa by a steel tooth of a horse-rake. The temporal plate of the orbit was probably fractured. Two months after the injury there was well advanced atrophy of the optic nerve with only qualitative perception of light and the remains of extensive absorbing hemorrhages throughout the eye-ground, large white patches here and there, and a partially absorbed hemorrhage at the macula.

The mode by which this class of injuries causes blindness furnishes an interesting subject of inquiry. The changes in the fundus suggest, in some cases, thrombosis, but this condition does not explain those in which the blindness ensued from simple atrophy of the optic nerve. The supposition of injury to the nerve caused by splinters of

bone from fracture of the orbital plate, or by pressure in the foramen at the time of the blow, or by post-ocular hemorrhage, is plausible. It is also possible that a thrombosis, if present, may have been produced by direct injury to the nerve. In the case reported before the Section in the spring of the present year, where total blindness followed the discharge of a gun near the side of the head, from detachment of the lower half of the choroid and retina, as in the case reported to-night, blindness gradually ensued from optic-nerve atrophy as a sequel to, probably, retro-bulbar hemorrhage.

Discussion.—Dr. Jackson had seen a case of injury of the brow with extensive hemorrhage into the orbit, which had caused protrusion and complete immobility of the eyeball, with absolute blindness within 48 hours. During the first few days no intra-ocular lesion was detected, except a very marked gray opacity of the retina with swelling. As this subsided, choroidal disturbances were found throughout the fundus with extensive hemorrhages in the upper-inner portion. The choroidal changes went on to atrophy and pigment absorption, and the eye remained blind, but regained almost normal movements.

Dr. de Schweinitz reported the case of a girl who fell, striking her head, and was found partly unconscious. A day later she complained of blindness. The right retina was bluish-gray with no interruption of the retinal circulation. In a few days the retinal haze disappeared and was succeeded by choroidal changes and complete blindness with white optic disk. The lesion in all probability was a hemorrhage in the sheath of the optic nerve.

Dr. George Friebis reported the case of an old lady who lost the sight of one eye a few days after receiving a slight blow on the head. The fundus was studded with hemorrhages.

Dr. Edward Jackson read a paper on *Auto-Skiascopy*. This requires the usual apparatus for skiascopy and a looking-glass. In this glass is seen the reflected image to which, as to a patient, the surgeon applies the test. One eye is used to study the refraction of the other. Since the image is as far behind the looking-glass as the surgeon is in front of it, the distance from the surgeon's eye to the observed eye is double the distance from the looking-glass.

For the plane mirror the light is brought close to the observing eye, and far enough to one side to leave the observed eye in the shadow of the nose. For the concave mirror the source of light should be placed at least one meter behind the looking-glass, far enough to one side to allow it to shine on the mirror in front of the observing eye,

but so as to leave the observed eye in shadow. The two eyes having to take the different rôles of observing and observed, proves somewhat puzzling at first; but when more familiar with the test, the observed eye is of positive assistance in keeping the light properly directed, since it sees in the looking-glass the reflection of the mirror held before the observing eye. In auto-skiascopy the refraction is not measured at the fovea, but at a point somewhat to the temporal side of the macula. The value of the method, both to gain familiarity with the shadow test and as a means of studying problems in physiologic optics, makes it well worth trying.

Dr. Schwenk exhibited and reported two *Cases of Rupture of the Pupillary Margin of the Iris*. The first, that of a boy, struck across the eye by a brick, showed four V-shaped nicks in the margin of the pupil, dilated to 9 mm. but contracted to 5 mm. under eserine. Vision was at first $\frac{2}{20}$, and in three days rose to $\frac{1}{5}$, after which it again declined owing to progressive opacity of the lens. The second case was that of a man struck in the eye with a corn-cob two years previously. The pupil remained one mm. larger than that of the other eye, with serration and cicatricial changes of its lower margin.

Pilocarpin in Chorio-Retinitis.—Dr. Hansell detailed two cases of non-syphilitic central retino-choroiditis, in which the disease had been checked and vision greatly improved by the injection under the skin of pilocarpin muriate, and alluded to two others that were still under treatment, in which the benefit from the administration of this drug was marked. In all the cases potassium iodid and mercury had been previously exhibited in large doses, without avail. In No. 1, vision had fallen to $\frac{2}{20}$. The patient received daily, or on alternate days, according to its effect upon the heart's action, $\frac{1}{2}$ to $\frac{1}{8}$ grain. In four weeks vision was restored to $\frac{2}{20}$ (?). In No. 2, vision was reduced to $\frac{3}{20}$, and, by the same treatment continued for seven days, was brought to nearly the full acuity. In none of the cases could a history of syphilis or other constitutional disease be obtained. Dr. Hansell's experience with pilocarpin in the above and other cases warranted his asking for the remedy a trial in the treatment of chorio-retinal inflammations, particularly in the acute form, and of opacities of the vitreous frequently associated with choroidal disease.

Dr. W. M. Sweet exhibited for Dr. Hansell a *Case Showing the Result of Puncture of the Sclera in Recent Detachment of the Retina*. The patient had, for some months, a small detachment of the superior portion of the retina, mainly of the superior artery and vein. Suddenly

three weeks ago, he lost all perception of light, excepting in a small spot in the foveal region. The retina was totally detached and the vitreous full of opacities. Two days after the blindness was noticed, an incision $\frac{1}{2}$ inch long was made in the lower and outer section of the sclera and a probe inserted to separate the edges of the wound. A considerable amount of semi-fluid material was forced out of the opening by pressure upon the opposite part of the globe. The next day, vision was greatly improved and a week later, with the correction of a low hypermetropia, vision was $\frac{3}{8}$ (?). The vitreous still showed some remains of hemorrhages. During the next few weeks vision varied between $\frac{3}{8}$ and $\frac{1}{2}$.

Dr. Wendell Reber exhibited for Dr. Hansell a *Case of Congenital Aniridia*, in a girl seven years of age. Vision was decidedly below normal on account of opacities in the lenses, also congenital in origin. The other parts of the eyes were healthy and showed no abnormalities. No other members of the family had congenital defects of any kind.

HOWARD F. HANSELL,
Clerk of Section.

Dr. Frank Allport has resigned from the chair of Ophthalmology in the University of Minnesota, having decided to leave Minneapolis and take up his residence in Chicago with his office, 1104 Stewart Bldg., 92 State St.



THE OPHTHALMIC RECORD

A Monthly Review of the Progress of Ophthalmology.

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EDITORIALS.

TO OUR READERS.

The sixth volume of the OPHTHALMIC RECORD closes with the current number, and the Editorial staff look back upon the past year as the most satisfactory in the history of the journal. The promises given in the initial number have, they believe, been generously fulfilled and, as a consequence, they are able to state that contributions to the RECORD have a larger number of readers and the periodical itself a wider circulation than any similar monthly.

During 1898 the management intends to follow a still more extended program and fully expects not only to increase the circulation of the RECORD but to furnish a journal that will be even better edited, better printed and better illustrated than the issue of 1897.

GIVE THE OTHER MAN THE BENEFIT OF THE DOUBT.

Some men seem to glory in condemning the work of others. We have in Ophthalmology a field of medicine and surgery in which there are great opportunities for observing what would appear to be the results of mismanagement of cases by other oculists.

A patient comes to us with a damaged eye, the result of an injury received some months or years before. We think we see how a more favorable result could have been obtained. We do not see the conditions that existed at the time of the injury nor the circumstances surrounding it. It is so easy, by tone or manner or words, to lead the patient to think that had he come to us in the first place we could have saved his eye.

A patient who has lost an eye as a result of cataract extraction certainly has much to grieve over. While the operation may have been

performed in the most perfect manner, yet the patient holds himself in no degree responsible for results, notwithstanding the fact that he may have failed absolutely to follow instructions. The operator may feel even more keenly the unfortunate outcome of the case, at the same time believing that he performed his whole duty in his management of it. Another oculist renders an opinion months or years later, basing this opinion entirely upon the patient's statements, which are usually inaccurate. He is unacquainted with the operator's ability, but in accordance with his egotism he seeks to defame his defenseless brother-oculist that he may add to his own importance. He does not at that moment think of his own mistakes, and it is very probable that at that instant another oculist may be looking at some of his unfortunate cases with an equally good opportunity for criticism.

Some of our eastern brethren have by years of experience and favorable opportunities acquired a world-wide reputation, and some of them seem to have an idea that no good can come from anywhere outside their own metropolis. Cases are referred to them from all over the country. Many of these cases are hopeless unfortunates. The patient who has traveled far drinks in eagerly every word uttered by one of these eminent men, while he, seeing "at a glance" that nothing can be done, too often, by word or manner, forever damages the reputation of some competent oculist. The patient does not forget, but returns to his home to spread the report, possibly by that time magnified, of the unskillful treatment received at the hands of the former oculist.

Cases do come to us in which evidences of mismanagement are so apparent that it is hard to hold our feelings in check, but there are times where we can not correctly judge from the condition before us what may have been productive of it. Where it is a reasonable doubt let us give the other fellow the benefit of it.

G. M. B.

OPEN WOUND TREATMENT AFTER CATARACT OPERATIONS.

The modern management of cataract patients shows a marked tendency to make them as comfortable as possible and to do away with all unnecessary restraints. Patients are no longer shut up in dungeon-like darkness, nor are they obliged to suffer the torture of a continued recumbent position in bed; but are allowed to spend the day sitting in a comfortable chair and in a light and well aired room. The

thick, hot, flannel rollers are a thing of the past and bandages of a light and cool material have taken their place.

While we fully indorse the laudable desire to cater to the patient's comfort, we are not prepared to go in this direction as far as Prof. Hjork of Christiania, who in a recent issue of the "*Centralblatt fuer Augenheilkunde*" very strongly pleads for the omission of all bandages after operations upon the eyeball. His reasons are that winking serves to cleanse the eye and to carry off the micro-organisms with the tears through the normal tear passages; bandages, therefore, stopping the movements of the eyelids, favor rather than prevent the contamination of the wound. From October 1895 to 1896 he used a bandage, but during the first 24 hours only, and since October 1896 he discarded bandages altogether. During this period 112 operations by which the globe was opened were performed (extractions, iridectomies, sclerotomies, needle operations) and "in all cases the healing was favorable."

We do not doubt that the punctures of a needle and the linear incisions of a keratome heal kindly under open treatment, and even that sclerotomy wounds, unless unusually extensive, will do well without bandages, for these wounds have no disposition to gape, but close up tightly as soon as the instrument is withdrawn. But when it comes to the large curved incision of cataract extraction we hold that kind healing requires something more than the aseptic condition of the wound; it requires in addition that the accurate apposition of the wound-edges shall be protected against disturbance by winking. The edges of these flap-wounds are easily separated by the slightest pressure of the winking lids; hence, if no bandage is used the sealing up of the wound is retarded and the chances for prolapse of iris are considerably increased. Prof. Hjork proves this by his own cases; for in 24 simple extractions performed during the period of the open wound treatment iris prolapse occurred 4 times or in 16 per cent. of the cases. In other words the accident is likely to occur twice as frequently under the open treatment as under protective bandages. This is not a favorable showing for open wound treatment, and surely can not induce ophthalmic surgeons to abandon protective bandages. We would advise the bandage as the safest treatment until somebody invents a cement by which the fresh wound can be firmly sealed up directly after the extraction. Then the movements of the lids could not disturb the edges of the wound, and, of course, bandages could be safely omitted.

F. C. H.

THE ACTUAL CAUTERY AND SYMPATHETIC OPHTHALMIA.

With the fashion of doing simple cataract extractions has come an increased demand for some effective and easily applied method of treating prolapse of the iris; and perhaps the most seductive of the methods suggested is to burn away the prolapse with the Paquelin—or galvano-cautery. This is effective and easily applied; and if it were safe, there would be every reason for recommending its general use. Unfortunately, evidence is accumulating which indicates that it is not safe. Some years ago, Kalt reported a case in which sympathetic ophthalmia followed its use, and during the present year Trousseau has reported two similar cases. To these I can add the case of a girl nine years of age, who was brought to me, some years ago, with a large prolapse from a wound of the limbus made by a slate pencil. I excised the prolapse and touched the stump with the galvano-cautery. Twice, in the succeeding two weeks, as there was still a little rough iris-tissue to be seen, the cauterization was repeated. The girl then went home with the eye apparently in excellent condition. She returned in about a month with vision in each eye reduced to counting fingers, and a typical sympathetic ophthalmia, which progressed, in spite of energetic mercurialization, atropine and heat, until all useful vision was permanently lost. Beside this, I have good reason to think from the report sent me, that another of my patients, a woman of 72, who had a small prolapse, after an extraction *with an iridectomy*, developed a sympathetic ophthalmia, which has practically blinded her, about three weeks after the use of the cautery.

Reasoning deductively, one would at first be inclined to regard the cautery not only as the best means of ridding a wound of germs, but as an excellent guard against subsequent infection of the tissues below the eschar. Practically, however, we find opposed to this conclusion, beside the cases just cited (which though not probably all simple coincidences, may have been such) the fact, well established among rhinologists, that actual cautery-wounds of the nose and throat are especially apt to cause severe reaction. My own impression is that cauterization with chemicals is much less likely to cause trouble. Several cases of severe meningeal disturbance from the use of the galvano-cautery in the nose have been reported, but none, so far as I know, from chemical cauterization. The fact seems to be that the tissues killed, but not destroyed, by the hot metal, form a favorable

medium for germ-growth; and also, perhaps, delay the formation of a protective granulation-surface. The difference between the results of chemical and heat-cauterization may be explained, partly, on the ground that the latter kills the tissues to a greater depth; partly, by the assumed antiseptic properties of the chemical eschar. The explanation of the general immunity of cautery wounds of the cornea from re-infection may possibly be found in the absence of blood-vessels and the density of the corneal tissue, in which the lymph channels are especially easily occluded by leucocytes or young connective-tissue cells.

In conclusion I feel like quoting from Trousseau, the words of de Wecker, which have received strong confirmation from a recent article of Knapp's: "It seems to me, that wounded eyes have often contracted migratory ophthalmia, not as the result of the injury, but from the operations practiced upon them."

H. G.

HYGIENE AND CARE OF THE EYE.

In olden times, it was said, darkness covered the land and gross darkness the people. It would still seem, judging from the ophthalmic surgeon's stand-point that gross darkness in regard to the ordinary hygiene and care of the eyes still persists.

Among all classes, even the upper, better-educated, there still persists a profound belief in old wives' fables, as to the care and treatment of the eyes, which passes all human understanding and is absolutely incomprehensible and absurd.

This really seems to bear out President Lincoln's statement that most of the people like to be fooled. Yet the fooling in this direction may take on a very serious phase if it result, as it often does, in the loss or obtunding of the invaluable sense of sight.

Time and again, patients come to the specialist complaining of a very sore eye, with a history of the *continuous* applications of poultices of tea leaves, of porridge of linseed, *et al.* They are greatly surprised that under such treatment the delicate organ did not get well, especially as they often say the poultice drew so well and brought such a quantity of matter out of the eye. No question of the deleterious action of this *continued* moist heat, much less of sepsis, enters their minds. Again, patients vigorously deny the application of anything so hurtful as a poultice, but state that they have applied a cold compress and kept it on, the idea of its rapidly becoming warm compress after remaining in contact with the body never enter-

ing their minds. How many eyes have we not seen hopelessly injured by the continuous use of this simple and apparently harmless remedy!

Again, what a number of people, so soon as they find their sight becoming defective, hasten away to an optician, where they are fitted with glasses, the optician at the same time making use of the occasion to berate the oculists, dilating on their absolute unnecessariness and, what is more important, the saving of dollars to the purchaser. In this case the least evil that can happen is the supplying of incorrect glasses, which can be rectified by the oculist when the patient comes to his consulting rooms. Of far graver import is it, however, when instead of being a mere matter of glasses, there is present advancing disease of the fundus oculi, glaucoma, etc. Here the delay in coming to the ophthalmic surgeon often results in serious, permanent deterioration of vision. Not a few such cases have come under my own observations during the past two or three months.

Another evil is the frequent application of eye-patients for treatment to their druggist who more frequently than not makes them up a lotion and ointment which is recommended as being the favorite prescription of some ophthalmic surgeon in the neighborhood. The remedies are used quite regardless of what the indications may be.

Not infrequently, blurred vision, especially if associated with headache, is considered as due to an upset digestion, liver attacks etc., the usual course of purges are taken and continued for some time, until when, finally, the patient appears, there may be found advanced albuminuric retinitis, optic neuritis, glaucoma, painless serous iritis etc. etc.

Examples could be multiplied *ad infinitum* of this "gross darkness," and now the question arises how are we going to dispel it. It is only too true, alas, that the entire lack of knowledge of eye treatment by many general practitioners of medicine may be held accountable for much of the trouble.

Through the ordinary day-schools much might be done. At the training schools for teachers, the so-called normal schools, elementary points could be touched on in the regular course of physiology. This is done in many places but far from generally enough. In turn these teachers when they graduate and are turned out into the world to teach could do much in advising pupils as to the right course to pursue in getting timely professional advice.

The subject of "ophthalmic opticians" who do their own prescribing has already been well thrashed out.

The proper training of the general medical practitioner, the inculcation of a few of the primary points in eye hygiene into school teachers, the dying out of the old school of sick nurses, with their home-made prescriptions for eye diseases, the prevention of counter dispensing by druggists, and the tabooing of the examining opticians will all tend to diminish the evils to which I have referred.

J. W. S.

Drs. J. G. Huizinga, H. W. Woodruff, Wm. A. Mann and Wm. H. Weaver have been elected professors to the Chicago Eye, Ear, Nose and Throat College.

Beginning with the January issue of the RECORD, space will be given to "News Items". Communications of this sort should be sent to Dr. Frank Allport, 92 State St., Chicago, not later than the 20th of each month.

The attention of the readers of, and advertisers in the OPTHALMIC RECORD, is drawn to the change in the publisher and office of publication.

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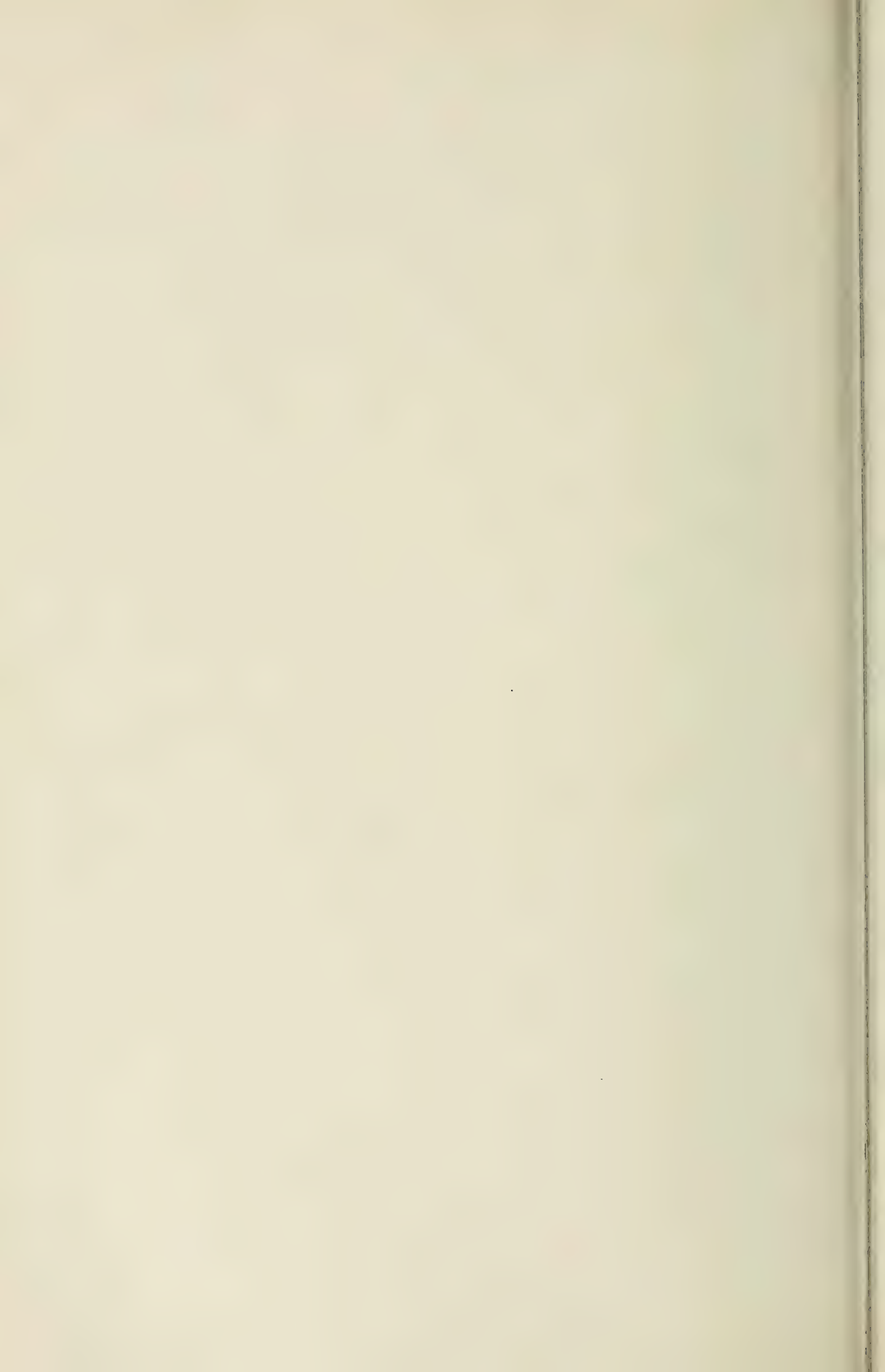
EYE-SIGHT TESTING.—It gives us great pleasure to call the attention of the profession to the picture and advertisement in the present issue. We cordially recommend Mr. —, the optician, to the profession, as he makes examination and measurement of the eyes for glasses without the use of Atropine. We have had occasion to send him our own patients for several years past with much satisfaction.



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CHICAGO



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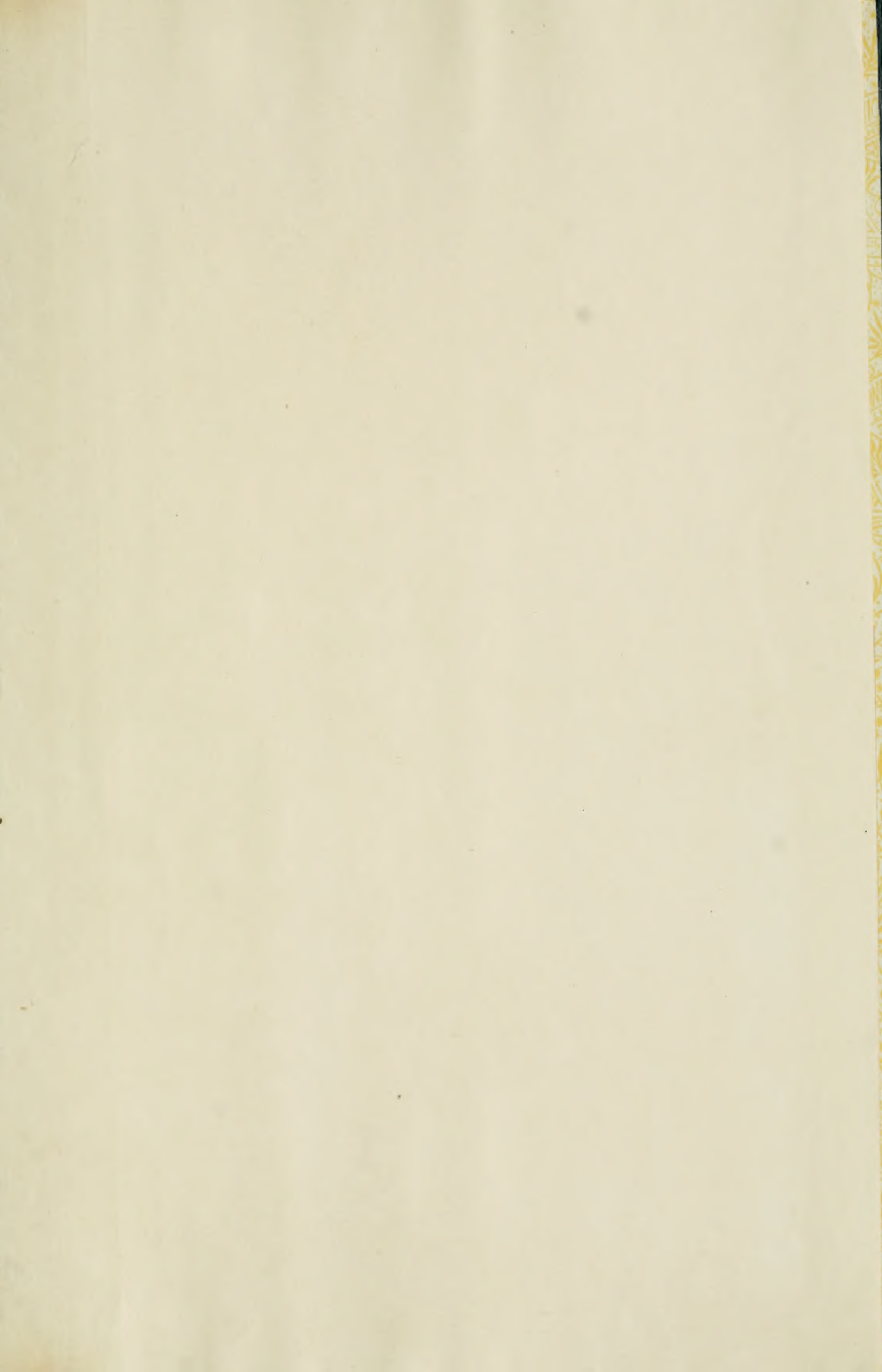
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